

CO-ORDINATION IN SOIL CONSERVATION

By J. F. TWINCH, (Soil Conservation Officer, A. E. & C. I. Ltd).

The passing of the Soil Conservation Act in 1947 made it possible for tremendous progress to be made in the protection of our soils from erosion and exhaustion, our veld from mismanagement, and the agriculture, so vital in this country, from eventual collapse. It is a doubtful point whether people in South Africa are "soil-conscious" or not; it is to be hoped that they are.

A general understanding of the advantages of soil conservation is not sufficient; how many people are aware of and understand the various aspects of soil conservation? These aspects embody the protection of (1) our soil from wash, from exhaustion and from incorrect use; (2) our veld from overstocking, unscrupulous burning, from being ploughed up and generally mismanaged; (3) our forest areas from abuse and fire; (4) our watersheds and natural storage areas from any form of exploitation.

It is not the object of this paper to deal with all these aspects in detail; the primary concern is the co-ordination of these conservation measures into a sound farming programme. These many aspects of soil conservation cannot be considered apart from one another. While they each constitute an important entity, no large scheme can ever be a success without co-ordination; and the agriculture of South Africa is large and vitally important to the population.

It is too often the case that farms suffering from soil loss by erosion and fertility depletion from too severe a cropping programme are contoured, but no co-ordinated plan is laid out. The result is that soil loss is checked but fertility depletion continues. Farmers are inclined to regard contouring as something akin to magic. Contouring alone is not sufficient and the contours themselves must be carefully planned and well constructed. If not, the results can be disastrous. In some cases agricultural lands cannot be contoured and sterner measures have to be applied.

Consider the soil conservation measures applicable to agricultural land; the stabilisation of the soil by strip-cropping, contouring and correct tillage. By slowing down the run-off of storm water the farmer automatically minimises the danger of floods. Then there is the maintenance of fertility by prevention of wash and by the rotation of crops and the more difficult task of building up the fertility by ley farming and by correct fertilisation.

The correct preparation of agricultural land means the correct use of agricultural implements. Accord-

ing to present-day standards, the faster a land can be prepared then the more efficient is the implement. Whilst speed is desirable in agriculture, the preparation of light soils, for instance, with the wrong implement may result in the pulverising of that soil—a most undesirable and dangerous state of affairs. Farmers should give more consideration to this idea of "the right implement for the right soil."

The pastoral side of our agriculture is concerned with the careful management of our veld so that the stocking rate is in proportion to the carrying capacity. Veld deterioration upsets the running of the farm by forcing the farmer to draw from his agricultural areas food that should be produced on the grazing areas. In veld management veld types must be fenced off and managed so as to give maximum returns; this is achieved by timely grazing, mowing, resting and burning if necessary. The protection of watersheds and vleis is essential for effective water conservation, while the afforestation of suitable areas should be a part-time task for all farmers.

These aspects, considered as a co-ordinated whole, give us our farm plan; a farming programme based and managed on correct land use. Correct land use is the foundation of stable agriculture and this concept of farm planning aims at the prevention of the damage caused by incorrect land use.

The compiling of a farm plan is no easy task; it is one that entails a thorough investigation of the whole farm. All the factors mentioned above are taken into consideration and soil samples taken to determine the value of the ground.

In the aerial photograph lies the first step in farm planning, for it is from the aerial photo that the farm can be quickly and reasonably accurately mapped. It is the aerial photograph that provides the bulk of the detail and the relative position of everything on the farm. Once the skeleton of the map has been completed it remains for ground surveys to be done in order to classify the land. Land is classified according to various standards. American classification ranges from Class I land, which is near-level ground requiring no conservation measures—soil good—to Class VII land, which is wasteland requiring protection purely for the conservation of water and preservation of wild life. Other information that should be on the map is the size of all arable areas, grazing paddocks, plantations, and so on; also the pH value of all arable lands. This last is a useful guide to correct crop selection for a certain soil

type or an indication of what treatment is necessary in order to create suitable conditions for crops not tolerant of acidity.

A farm plan drawn up in this way determines the farming policy and ensures the safekeeping of the natural resources. In some cases the implementation of a farm plan of this kind is very difficult because of previous mismanagement. In some cases of severe erosion large areas of a farm are rendered economically useless for the period required for their rehabilitation, but eventually these areas must fall into the overall plan.

I am not suggesting that this detailed type of farm plan is necessary for the sugar farmer; nevertheless it would be a most useful contribution to the efficient running of the farm. Aerial photographs are easily available and not very expensive. We might perhaps develop a technique whereby we could demark areas of the same size for rotation purposes, roads and railways could be mapped, and in general better co-ordination maintained on the farm.

This concept of co-ordination in conservation is very important to those of us who are concerned with soil conservation in Natal, and especially Umvoti County. This is an area of high rainfall and a watershed area supplying water to the coastal areas where the cane is grown. Soil conservation is, therefore, a primary concern to you, even if you are concerned only with what could be classed as a soil-stabilising crop. The stabilisation of agriculture in an area like ours can only be made possible by the co-operation of all farmers and the co-ordination of soil conservation practices.

In Umvoti the rainfall is high and heavy storms frequent, the soils are erodible and the topography steeply undulating. We therefore have a great deal of bad erosion. This is due mainly to the fact that land has never been classified and land that should never be used for annual cultivation has been under the plough for many, many years. We are fortunate in being in an area where grass is both easy and profitable to grow and much of this land that should not be ploughed is being established to pasture. The planning of farms according to correct land use is progressing slowly and we hope that farmers soon will all be conscious of the advantages of these farm plans and not regard them as an imposition and a threat to their independence. We would like you to have the water from our catchment areas, but we begudge you the soil from our lands.

The PRESIDENT said that the sugarcane crop was a heavy one with a large root system, and where contour cultivation was properly carried out the land was not so vulnerable to soil erosion as was the

case with other crops. There were cases where contour cultivation was not done, but these were not so much in evidence as they were years ago.

However, it should be remembered that while the total area of sugar estates in South Africa was some 700,000 acres, only 350,000 acres were under cane at any one time. That meant that at least half the land was under grass or other crops, or being fallowed, while probably another 40,000 acres were under cane in the first stages of growth. Thus there were nearly 400,000 acres of land as much subject to erosion as any in the country, and to this the author's advice and remarks fully applied.

In the sugar industry the benefit to be derived from aerial photographs was realised to some extent, and they were becoming more and more used, not only for survey purposes, but also to enable the cane grower to get a better picture of the progress of his farming operations.

Mr. TWINCH said that he had not realised that there were some 400,000 acres not under cane.

Dr. BATES considered that, to be effective, soil conservation must be general, and he would be interested to know what organisation existed in South Africa for handling the subject on a national scale.

Mr. TWINCH informed the meeting that the only national organisation was the Government's Extension Service. The country was divided up into conservation areas, each area being considered as a separate entity, and this constituted the overall planning under the Department of Agriculture. The field officers such as himself went on to the farms and worked out the details with the farmers.

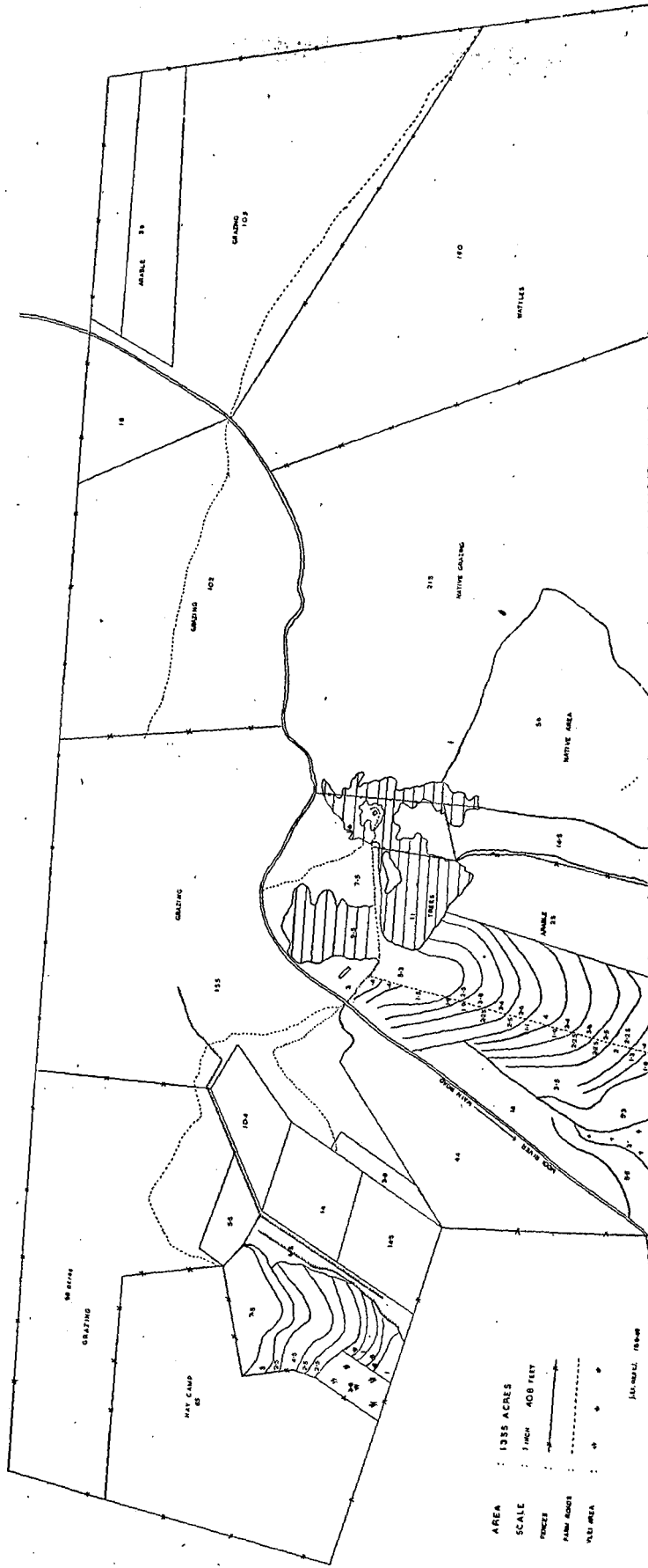
In reply to a question by the President, he stated that his firm had an agricultural advisory staff of seventeen, of which nine were in the field and scattered over the country. He was the only one stationed in Natal.

Mr. DU TOIT wished to know what help the Government offered the farmer through its Extension Service; how many conservation districts there were; if there were local committees which drew up a co-ordination plan to which all farmers had to adhere, and if any necessary surveying was done free of charge.

Mr. TWINCH replied that there were 207 conservation districts of varying size scattered over the country. Each was controlled by a district committee and the Government Conservation Officer was an ex-officio member, but was instructed by this committee. Surveying had to be done by a Government surveyor and was free of charge. A farmer, not in a conservation district, could get a



AERIAL PHOTOGRAPH. The first step in farm planning.



FARM PLAN. Drawn up from aerial photograph and ground surveys.

33½ per cent. subsidy with a maximum of £50 for conservation earthworks; but if he were in a proclaimed district he could obtain a 50 per cent. subsidy. In the case of his firm there was no subsidy involved, and the farmer was under no obligation whatever, but on the other hand he must do all work at his own expense.

Dr. BATES was happy to say that in Rhodesia practically the whole of the European farming zone was split up into Intensive Conservation Districts.

Mr. TWINCH pointed out that of the 80 students who qualified with himself in South Africa, 25 went to Southern Rhodesia.