

SOME PROBLEMS OF FARMING IN THE SUGAR BELT

By Dr. J. FISHER, Principal, College of Agriculture, Cedara.

This age in which we are living is unique from many points of view. Not only in the intense nationalism everywhere evident in the world, not only in the economic crisis which crashed down on the world, not only in the enormous control exercised by boards upon all, or nearly all, of our main primary products, but also in a sudden realisation of what is happening to the earth's covering, the soil, in many countries and under very widely varying conditions.

Soil erosion has come upon us like an avalanche. The muddy sea water outside is proof that the life-blood of South Africa still drains away and is lost. Fortunately for the coastal belt, even though it has the highest rainfall, erosion is not one of the serious problems in this zone. Seeing that this is the case, it might be well worth our while to think of the reasons why it is not serious, when the rainfall is the highest.

I am of the opinion that the practice of sugar growing as carried out guards against this evil. Primarily our cane lands produce a crop which is not very exhaustive to the soil. Sugar, in itself, a pure carbohydrate, contains no soil fertility, and if it was just sugar alone which left the soil, there could be no soil erosion due to loss of fertility. In any case, soil fertility is not heavily robbed by cane, and particularly so when the cane is trashed and the bulk of this worked back into the soil. The return of the filter press cake, etc., to the soil, though not all to just the place where it came from, keeps a circulation of this fertility in active operation.

Crop of 40 tons of cane, complete removal, according to Dr. Stubbs' estimate (in lbs.) for Louisiana—

N.	P ₂ O ₅	K ₂ O	Lime.
136	59	87	71*

Another factor which operates in this area is that the land is not allowed to be bare for any length of time. Bare soil, whether patches in the veld, arable lands which have been discarded, arable lands still in use, simply invites erosion. But, covered as your lands usually are with a wealth of cover, there is little pounding of the soil by tropical storms, the foliage of the cane usually catching and destroying the pounding action of the rain instead of the soil, and then the steady flow of the water down to the soil with easy access from cane stems to roots in the various fissures and

cracks of the soil. True, when land is in preparation for plant cane there is a chance for a little erosion to take place.

The high degree of efficiency attained in cultivations, the contour operations, ridging, planting, etc., are excellent precautionary measures. Occasionally, unfortunately, they do not provide a sufficient safeguard against extraordinary downpours. It becomes a very difficult problem to control water falling at several hundred tons per acre in a few hours, and the only practical suggestion, apart from those you put into operation consistently, would seem to be restricted areas on contours to be cut each year, so that only a rather shallow belt will be bare, whilst above and below will be a similar belt carrying cane. Restricted areas such as these will break velocity and slow up water and minimise erosion. This means more work in cultivation of smaller areas, more shifting of train lines, etc., and you may not consider this worth while. Erosion, however, is taking such a toll of our soils up country that the thought must be ever present and the desire must be constant that everything shall be done to minimise this national evil to as large an extent as is possible.

Fertilizers.—The cane growers have probably tackled their problem from a viewpoint of the return of successive doses of fertilizer per acre, more so than other farmers in South Africa. By a steady endeavour to maintain and improve fertility, the crops hold of the soil remains good. Growth above ground reflects conditions in the soil.

Fertility replaces water in that rich lands will grow quite good crops in droughty years, whereas poor soil will not. This phenomenon has been amply demonstrated this year.

Uba and Co. Canes.—Years ago, before your Association had been long in existence, I drew a picture of the somewhat precarious position your industry might find itself in, being entirely dependent upon the good behaviour of the orphan "Uba." I stressed the need for other canes to be procured or developed, and I feel a certain degree of responsibility to-day for the fact that these newer canes have brought other problems into the cane belt. If everyone had kept pace with increased consumption of sugar, marking time with the increased production, the present-day difficulties might not have arisen. The industry, however, even to-day, would not throw out new canes that might be superior to Co.281, 290, etc. They might definitely add to the problem which now exists in the sugar

* According to estimate by Warington.

growing zone. It cannot be thought that we have reached already the highest sucrose possible in our sugar canes. Science, applied to the breeding of sugar canes, may evolve higher sucrose canes than any which are in cultivation to-day. I believe it would be looked upon as real achievement, no matter what other troubles followed in the wake of these high-sucrose canes.

If to these high-sucrose canes there is added the increasing knowledge of fertilizers and their reactions in various combinations, then the tonnage also of cane per acre may be considerably increased.

The growth of Sunn hemp as a green manure crop in the cane rotation, fully supplied as Sunn hemp usually is with the nodule organism, brings in an increase in the total quantity of nitrogen, and probably an increase in the availability of phosphates for the cane as well.

Some of our soils are so deficient in nitrogen that a single dose does practically no good unless it is followed by a further dose. One small sip to a very thirsty man does little towards quenching his thirst.

Sir Frederick Keeble, in a paper read before the British Association and dealing with South African soils, states: "Though a dressing of phosphates adds but little growth to that produced by a single dressing of nitrogen, a double dressing of phosphates added to a double dressing of nitrogen brings about a marked increase." One dose of nitrogen on permanent pasture does little more than intensify the green colour. Thus there may readily come about in the coastal lands a still further increase of sugar cane and consequently potential output of sugar without any further compensating increase in consumption. It would seem wise, therefore, to encourage any industry which requires sugar as one of its essentials and so lead to increased industrial consumption.

The present position.—To-day, through rationing of tonnages, very considerable acreages of cane are being discarded from sugar growing, and they are perhaps the most serious problem which confronts the cane grower to-day. It may be advisable, therefore, to look into the position from this angle. There will be two angles to look from:—

- (a) the planter with restricted acreage and hence with only a few acres to be discarded, and
- (b) the larger estate with considerable acreages thrown out.

These will alter the solution of the problem. In both cases, however, the land jettisoned will be the poorer areas, the marginal areas from a fertility or geographical viewpoint. These lands will—temporarily, anyhow—pass from cane growing. Should

the capital value of the farm be reduced when all the farm cannot grow marketable cane? If we put the position in the reverse way we may get light from a different angle. Did the values of the farms increase, and by how much, when the Co. canes replaced Uba? If so, then they should, logically, be reduced in proportion when the tonnage of cane is restricted.

There is no restriction in the tonnage of sugar, i.e. the same total tonnage of sugar is manufactured, and hence the thrown-out lands really appear as an extra.

If these surplus cane lands had to be valued at the high price of cane land, then their economic utilisation would be a much more serious problem. If their value depends upon what they can earn in a cycle of years, then there may be a profitable use for them. Such lands will seldom be in blocks easy of layout or supervision and management. They will frequently be shallow, shaley shouldlers of hills, swampy bottoms, perhaps with clay underlying; they may be treeless and without drinking water. They thus become difficult bits to organise into a thorough system, and here we face directly up to the problem we are considering. These lands have good rainfalls; they are of fair fertility, they are hot. There is no frost. The winter is not wholly dry, so that growth of various crops could be expected.

If crops are to be grown on these discarded lands, what crops could be grown?

Trees.—Yes; but these do not leave the land in a fluid condition. Land planted with trees cannot quickly be brought back to sugar should the need arise from any cause whatever. Some variety of tree would be recommended by the Forestry Officers, and anyone considering one or more blocks of trees should not fail to consult the local forestry officials. Much timber is imported to-day, and efforts are being continued in the direction that South Africa should supply considerably more of her own requirements than she does to-day.

Nut Trees, Maize and Kafir Corn.—These can be grown fairly well, but their planting time is usually a busy one from other aspects on the cane farm, and these crops planted out of season do not do too well.

Tea probably offers a fair opening, provided sufficient is grown for fermentation and other processes, or provided that the present manufacturers would be prepared to purchase it. Rapid transport is available for conveying the picked leaf from the plantation to the factory.

Cotton.—At the present time—let us hope that it will be only temporary—there is an added outlet

for cotton for war purposes. Some cotton could be grown.

Arrowroot, Cassava, Ginger, etc.—All grow, but their total marketable quantities are small.

Pineapples may find an outlet for canning, or bananas for banana flour, but careful study would have to be made of the returns, markets, labour required, and its periodicity and many other problems that would present themselves.

These crops, however, keep the system fluid. A ready change could be made in any desired direction.

There is the further aspect, and that involves livestock as a major factor. This is grass as a crop for animal consumption and the production of livestock products. Discarded cane lands will very soon be covered with grasses which volunteer in those lands. These grasses are not worthless, useless grasses, but grasses which are palatable and nutritious. Such grasses as U'babe, i.e. Panicum in its various species and varieties, Rhodes grass, possibly Brachyarias, etc., are valuable grasses, and when the lands are ploughed, disced down and left, will be very soon colonised by these grasses. The discarded cotton lands in Zululand react in the same way. The problem of which a solution is required is, how long will such grasses maintain themselves under grazing conditions, continuous grazing, or rotative grazing, and each of these with and without any further application of fertilizer? Here is a very important, very practical problem which demands investigation. If these pioneer invaders can maintain themselves under rotative grazing combined with the addition of some fertilizer, would they not be preferable to other grasses not acclimatised to coastal conditions and which can only be established by purchasing the seed and incurring additional expense?

There are many grasses which will grow on the coast under one condition or another, but not necessarily on the poorest cane lands which will be thrown out of cane culture. It should be realised here that there is a balance between the soil and its fertility, the quality of the pastures that it will grow, and the quality and producing ability of the livestock on these pastures.

There are places for—

Kikuyu,
Rhodes,
Napier fodder,
Paspalum dilatatum and notatum,
Brachyaria,
Digitarias, etc.,

yet their blending into a system of livestock farming still requires careful study. For example: will

Kikuyu, ploughed up in March-April, not continue to give green grazing through the winter when the fertility is maintained at a high level? Will the normally summer growing grasses afford sufficient food in the winter and early spring, remembering the demands for the various classes of cattle?

Now, up to the present livestock farming has not played a very important role in the coastal districts, and the farmers in that area are not really livestock farmers, so that there are two factors which have to be brought together.

There is no reason why livestock, and here I mean cattle rather than other livestock, should not do well, thrive and prove profitable on the coast, when their requirements are understood and are met by the coastal farmers. Some critic may refer to the disposal of livestock and livestock and refer to the difficulties of marketing as experienced to-day. The reply here would be that in sunny South Africa we have much under-nourishment, malnutrition or whatever term you care to give it, and amongst both white and black. Is there not a very large market for meat and meat products amongst our native people? Will progress not demand a larger ration of meat in the menu of our native people? Will the native reserves, soil erosion-ridden as they are to-day, continue to supply all the meat foods that our natives require? There is a large market ahead. Organisation and processing may be necessary, but these will surely come. Our Industrial and Agricultural Development Fund will help here. So we return to our livestock farming in this coastal belt.

Disease factors we can largely rule out. The dipping tank, ear and tail dressing, and these done thoroughly, will result in very few losses of stock on the coast. Deficiency of minerals is easily corrected. Foodstuffs can be produced in quantity. The winter ration for working oxen has been canetops for years. They will keep dry cows, big heifers, store oxen which have no work to do, equally with the working oxen.

To take the man with a limited area thrown out of cane, can he contemplate any other system of livestock farming than using livestock for almost immediate turnover? He cannot breed stock; he must buy grown stuff and keep it for a short time only, turning over a fairly quick profit. This is very easily said, but there is much more to be thought about. If these bullocks are purchased in April-May, when in top condition from veld, to hold this for a few months—two, three—and then to add concentrates to their ration and market the bullocks in September-October. So far quite easily visualised. But now what about the September-October to April period? Can further steers be

purchased in September-October and be carried through the summer and put on enough condition to be sold in April at a profit? This is a very difficult question to put an immediate answer to, and I did not promise to give answers to all the problems I might touch upon.

Another aspect of this small area change might be considered, and that is by the introduction of the dairy cow. Many people hold the opinion that it is the intensive animal in an intensive environment that forms the correct balance. The handling of dairy cows, provision of pasture food, utensils and marketing of the products come into this picture at once. We have no time to deal with all these aspects at the moment. *On the larger estates* the same policy could of course be followed, but there is a greater chance that on these estates a policy of breeding cattle on the coast could be followed. Thus there would be a breeding here, with calves at foot, yearlings, two-year-olds, and perhaps even three-year-old animals. Thus only a quarter, approximately, of the animals maintained would be disposed of annually. The management of these breeding herds, as well as that of the yearlings and two-year-olds will have to be worked out. Fencing, provision of drinking water, dipping facilities, sequence of grazing grasses or crops together with surplus cane-tops and surplus grass, will demand very careful and practical consideration.

Some of these points are already receiving attention. Investigations are under way, but many more require to be considered. When shall the calf-drop be? How and what pastures shall be established; how shall they be managed, what expenses will they carry, how long will they last, etc.?

And what about the breeds of cattle for these various purposes. There is and has been in the coastal belt of Natal and in Zululand indigenous cattle, accustomed to the conditions of these areas, yet stock very small, poor in-milk production, slow in maturity, that are able to survive dry and difficult periods. Is it with these animals that farming should be carried out, or can the recognised British breeds be expected to do better under these coastal conditions?

On the coast I have seen and know of Jersey cattle which do well on the coast. I have seen Friesland cattle little more than half the size they ought to be. I have seen Afrikander cattle plump and fat and apparently quite in unison with their environment, and grades of these Afrikanders doing well. I have never seen Royal Show winners in any of the recognised beef breeds that have been born and reared on the coast. Is there something inherent in the Zulu and the Afrikander which does not occur in the British breeds, the descendants of *Bos taurus*, the others being from *Bos indicus*?

Recent investigations show that the Zebu type from *Bos indicus* have greater ability to withstand the more tropical conditions than the British breeds have. They have a larger skin area, greater numbers of sweat glands, shorter hair, greater resistance to tick-borne diseases, consume less food and seem able to extract more nourishment from the coarser fibrous foods than the British breeds can. These characteristics occur not only in the pure Zebu and Afrikander or Zulu, but even down to about one-eighth blood. If the British breeds fail during the alternate part of the year to put on weight, i.e. October-April period, will the animals carrying half down to one-eighth Zebu blood not supply the answer? I have seen and had to do with the cattle at the Leper Institution at Amatikulu for years, and there the foundation stock was Afrikander, and the dominant characteristics of a breed persist, coupled with selection and discard of the unfit, for a number of cattle generations.

The Afrikander, with a bigger frame, more flesh, earlier maturity, is hence more likely to provide a suitable cross or grade than the Zulu, and from this source there may come the animals that we are looking for.

Breeding trials are being started and observations made upon cattle of different stamps, and a committee has been appointed to keep in close touch with these and the pasture development, so that facts will emerge steadily which will confirm or otherwise what at present is still unsupported by demonstrable facts.

In these ramblings there has not been a large amount of definiteness, and I have endeavoured to probe the problem rather than to attempt solutions. If the problem is clearly visualised and its various implications recognised, then the ground is cleared ready for progress in its solution.

Without a full appreciation of the problems, hasty or wrong conclusions may be arrived at. With a full conception of what is to be done, some progress has already been achieved; and I trust that some line of thought may have struck a correct wave-length in one or two cases which will lead on towards a solution of some of the problems of farming in the sugar belt.

College of Agriculture,
Cedara.
1st April, 1940.



The PRESIDENT in the chair remarked that while agricultural papers were in the majority at this congress, the present paper which was now open for discussion was a most stimulating one.

Mr. DODDS pointed out that while there were not many planters present the paper would be circulated to every one in the industry. Mr. Dodds then spoke of the over-production, and how a lot of canefields would be left out of production. A planter naturally only wanted to discard the poorer fields, and furthermore was not eager to commence planting small crops in place of sugar cane. The Natal Coastal Crops Committee have found grounds for tentatively recommending pineapples and soya beans as alternative crops.

The rearing of cattle would be as Dr. Fisher said rather a drastic change from sugar planting. Grass cultivation in any case required expert attention, and the problem of marketing milk and dairy products would call for advice at every turn.

In conclusion he thanked Dr. Fisher for his most constructive address.

Mr. FOWLIE referred to Dr. Fisher's statement that it was practically impossible to obtain a con-

stant supply of food for a herd of cattle direct from the fields, as such is seasonable. The speaker suggested the storing of cane tops? They form an excellent bulk food! We were not dependent on the food from the fields all the year round, as much of it could be stored away to be used in the scarce season.

Dr. FISHER admitted the possibility of storage, but added that this would run up labour costs. He said we should make our stock do all the labour, harvest their crops and as much as possible take the dung into the fields and spread it, thus assisting in reducing harvesting costs.

He knew that Mr. Deenik was reading a paper this afternoon on cane tops silage and therefore did not deem it necessary to refer to it in his paper.

The PRESIDENT thanked Dr. Fisher for coming down to the congress, adding that the cane farmer in this country was an industrialist and would have a hard row to hoe before he could get down to ordinary farming. (*Applause*).