

Mr. Van der Merwe replied that he was afraid he could not give any new remedy. The usual methods were to erect suitable scarecrows in the fields, poisoning, trapping, etc.

The Chairman, in thanking Mr. Van der Merwe for his paper, stated that a great many of the members had probably got a different opinion than they

had at the beginning of the Congress of the personality of the average Government expert. They perhaps thought he was too much of a pundit to worry about their troubles, but it was found that they were all intensely human, and asked for nothing more in their work than to be acquainted with our troubles. It was very pleasant to find that this was so.

Planters' Practice in Cane Agriculture.

(Paper by Capt. F. E. CREIC, Umhlali.)

It was with great trepidation that I received a request from the Secretary, Mr. Eadie, to provide a paper on "Planters' Practice in Cane Agriculture." I fully realised the great compliment which was paid to me, but at the same time I cannot claim to be anything but an ordinary planter, although I try to improve my methods year by year, and produce the best possible cane which my farm is capable of yielding. I do not, therefore, set up to be an authority, nor do I wish to be guilty of any impertinence in setting myself up as one capable of instructing my fellow planters. At the same time there are results of experience which come to all of us from time to time, and knowledge applied to methods, which perhaps come to some of us more than to others, and it is these plain results of what I might term successful experience which I have recorded in this paper in the hope that they may be of some service to planters, and provide food for discussion and thought at this congress.

My farm, which, as most of you probably know, is in the Umhlali district, is composed mainly of heavy black soil, consequently it is with that class of soil I am dealing in this paper.

Planting is undoubtedly the first operation with which the cane farmer has to familiarise himself, and the greatest care should be taken in the selection of cane for planting. My best results have been obtained when 12 to 14 months old plant canes have been used. It is my custom to plant only the best and the most robust of the canes, after removing the basal joints, and to lay the canes in the drills alternately base and top. One should always remember that as the cane remains in the soil for at least eight years, it is obvious that scrupulous care should be taken with the planting. I use nothing but plant cane. All plant cane should be handled most carefully, so that the eyes are not injured. In setting the plants in the drills it is best to remove all heavy clumps to ensure that the bed in which

the cane lies is in a nice friable condition. The plants are laid side by side in two continuous rows, the one distant from the other about 4 inches, and the drills are from 4 ft. 6 in. to 5 ft. apart.

I may say I hope to see the time when it will be considered a crime to plant anything other than plant cane.

At the time the cane is planted the soil receives a dressing of from 400 to 500 lbs. of fish guano and bone meal per acre.

Without doubt the best months in which to plant are October and November. Sometimes cane is planted later than December, but the only consolation lies in the fact that the seedlings are in the ground. Late planting is never really satisfactory, but the majority are influenced by the late rains.

It is a very important thing never to plant the canes too shallow. While they must not be buried too far under the surface, they must also not be too near the top. When planting during a damp season and on a humid day, only a very light covering is necessary, but when planting in dry weather the plants should be covered up fairly well. They should at least be covered sufficiently to keep the air out. If a drought occurs it will probably dry up the cane seedlings.

The very greatest care should be exercised in the selection of fertilisers, so that the best results may be obtained from the soil. The question of price should not come first. Our great aim should be, by every means in our power to maintain our soil in as normal a condition as possible, and to endeavour to give back to it the plant foods that have become exhausted by long ratooning. No one can say with certainty that this fertiliser or that is the best for your soil, but fertilising experts, having scientific knowledge, can help us with their advice, and prescribe for our soils a useful tonic. What our soils

Planters' Practice in Cane Agriculture.

want, and want badly, is humus or vegetable mould. So we should conserve all the vegetable matter and kraal manure we have and plough into our lands.

In a most interesting work on sugar, by Charles G. Warnford Lock, Benjamin E. R. Newlands, and John A. R. Newlands, L. Wray (another writer on sugar matters), is quoted as saying that he feels quite convinced that if all the trash and bagasse were ploughed into the soil while yet in a fresh condition, the cane would require no further manuring. This goes to prove the value of vegetable mould, or humus, and is a strong argument against burning.

Much as our soils on the coast require lime, I feel that great care should be taken in the way it is applied, and the quantity used, as lime tends to destroy humus, the great essential that our soil is deficient in, so it behoves us to treat the question of liming our fields most seriously, and consider the desirability of following up any liming we may do with a good supply of organic manure.

So far, bone meal, whale guano, superphosphates, and potash have proved the most satisfactory commercial fertilisers I have used. When in doubt I use bone meal at the rate of 500 lbs. to the acre. Recently I decided to use a mixture of bone meal, superphosphates and potash, and the result is good.

Sometimes it happens that a planter is disappointed in the response his field has made to the fertiliser, but one can never go wrong in adding a little kraal manure to give it life. For heavy soils I have found bone meal and whale guano give excellent results in a minimum dressing of 400 lbs. per acre.

I believe in liming a little and often, rather than in using large quantities at long intervals. For an old field that is played out I use 1,500 lbs. to the acre, which I regard as a heavy dressing. For general sweetening purposes I use from 600 to 800 lbs. of carbonate of lime, allowing the requisite number of bags to the acre, and have it spread over the land by hand.

After the lime has been added to the soil it is harrowed with a disc harrow and the field allowed to lie fallow for about three months before planting takes place. After the expiration of this period the land is ready for planting.

In about 30 days after planting, the seedlings should have made their appearance, and if the weather is suitable their growth will be fairly rapid. Accompanying the young plants will be a host of weeds, which have to be kept under. Weeding thus becomes the most important cultural operation as the young cane advances. On no account must weeds be allowed to obstruct the progress of the young plants.

Weeding is usually done on task, but the wisdom or otherwise of this depends upon the quantity of weeding to be done and the class of weeds to be dealt with. A task is set by judgment and experience, and depends entirely upon the condition of the field. It may be heavy weeding, or the land may be dry or not quite friable, which makes it easier. On the other hand, some weeds are very hard and brittle. These factors must all be taken into account when setting task.

I prefer to plant 5 feet apart in the rows, which some planters think adds to the labour of weeding, but the first ratoons swell out, and if no allowance is made for this there is not sufficient room for cultivation and scuffling. Thus the full 5 feet between the rows make provision for better cultivation.

The weeding of young plant cane is a matter of the very greatest importance. I have thoroughly realised that in order to ensure good results, hand-weeding in the rows of cane is essential in the early stages of its growth. Should the weeds be allowed to smother the young shoots, harm is done and the growth greatly retarded. Sometimes I find it necessary to weed twice by hand in the rows, using the hoes only between the lines. The work is slow and costly, but the money is well spent.

Another most important operation is covering in cane when planting. This should be done carefully and thoroughly, only the softest soil on the sides of the drills being used, and evenly distributed. In cases where hard patches of land occur, and where the soil refuses to become friable, I find that by picking the bed of the drills up well, and adding kraal manure and rough sand and covering the canes with sand, the shoots come away quickly and keep pace with the remainder of the field, which they otherwise would not do.

Covering in cane with the use of a small plough has not proved a success with me in hard black soil. Covering in by hand appears to be the only satisfactory method. I understand that on soft, sandy soil light ploughs are used for this purpose with success.

Great care and thought should be given to another very important matter, that is, setting out drills, particularly on steep hillsides, so that the evils of erosion may be arrested as far as possible. Breaking up the hill in sections with narrow breaks between is often very helpful, forming the sections so that the drills run straight from break to break. The appearance of a field does not matter. Concentrate on conserving your loam. Erosion, if not checked at the outset, will eventually prove disastrous. This also greatly helps to save fertiliser being washed out by heavy rains.

Planters' Practice in Cane Agriculture.

Drainage of fields is a matter that must be gone into most carefully. I have proved beyond doubt that a well-drained field ensures a good crop and that neglect in this respect yields disappointment.

The most satisfactory way to prepare an old field for replanting is to plough out the old roots as soon as possible after reaping, using a disc plough for the purpose, and to follow up immediately with a heavy disc harrow (not a cutaway harrow), so that the old roots may be well cut up and die quickly. Then allow the field to lie fallow until weeds and herbage are well established, then cross-plough, again using a disc plough, and follow up with a disc harrow and work the soil down well. After this, plant a crop of beans, which besides adding nitrogen to the soil has the effect of making it more friable.

Three months before planting, lime the fields, using from 1,000 to 1,200 lbs. of carbonate of lime to the acre; then harrow the lime and bean stalks well in, and let it lie until planting time comes along.

In normal seasons, providing both ploughing and harrowing have been well done, I have found the foregoing method a satisfactory one, but if, as is sometimes the case, the tilth is not satisfactory, then a third ploughing, even with small ploughs, is of great benefit—in fact, the more the land is turned over and worked up with plough and harrow the better the yield.

I consider that no trouble should be spared in the preparation of an old cane field. We must remember that we are dealing with splendid land that has given of its best for eight or ten years, in cases longer, land that has borne crop after crop of cane, which may have been planted without any fertiliser—land that is tired out, exhausted, and that has been robbed of its fertility. It is only natural that such land requires care, rest and good treatment, otherwise how can a further eight years of strenuous work be expected?

It is beneficial to grow a crop of beans or cow-peas for their nitrogenous value and plough them in. I have had very good results from planting a crop of beans and reaping them, the nitrogenous nodules at the root of the beans adding friability to the soil.

Trashing is unquestionably the right thing to do. The soil requires humus, therefore burning must be harmful. The extra cost of trashing is repaid by the value of the leaf mould which is returned to the soil.

All the same, on most farms there are low-lying wet patches where trashing may do harm. On such places it is advisable to burn the trash off after reaping the crop, for if allowed to remain undisturbed it has the effect of souring the land and preventing the growth of the young ratoon shoots. I have made a practice in the past of burning off the

last crop of cane when I intend ploughing out. I am now confident that I was wrong in doing this, for I know I have robbed the soil of so much humus. It is my intention to discontinue the practice.

Universal trashing would undoubtedly benefit the industry enormously.

Of all the important matters that planters have to deal with, I consider the most important of all is the treatment of old fields. This should be our principal study.

Always remember that a tired hard-worked field requires rest, care and generous treatment before it is fit to work again.

As to whether cane should or should not be burned, I emphatically declare against this practice. Trashing is far more beneficial to the soil than burning, notwithstanding that a burned field will come away quicker than an unburned one. The trash keeps the moisture in the ground and the weeds down, and as it decays it forms a valuable manure. In the case of certain fields, such as very wet ones, burning is permissible, experience having shown that a very wet field seems to respond better to burning than it would to trashing.

Replanting Misses.

After planting a field I leave a few bundles of sets carefully prepared and laid side by side on a thick bed of damp trash, in a damp part of the field, with a heavy covering of trash on top. This keeps the canes warm and encourages the eyes to come away quickly. When the time comes to replace any misses, the reserve sets are quite forward, having shoots from one to two inches long, and if carefully handled and planted, using a little kraal manure to help things along, very shortly catch up to the main planting. I have found the foregoing a most satisfactory method of dealing with misses.

Early Cutting.

I have found that care should be exercised in the selection of fields for early cutting, i.e., during the months of May and June particularly. If possible only those fields that are marked down for ploughing out, should be cut in those months. During July the warmer and damper fields should be cut, leaving the higher, colder and drier fields for August and on to the remainder of the season. I have found that very serious damage can be done to a good field of hill cane—particularly if the hill is a dry, cold one—by cutting in May or June. No matter how well and carefully the planting may have been done, the roots cannot stand the long spell of cold, and lack of moisture, consequently the ratoon crop from such a field is bound to be disappointing.

It is most difficult to work out cutting operations exactly as one would wish—but by careful planning quite a number of difficulties disappear.

DISCUSSION.

Capt. F. E. Greig, before commencing his paper, exhibited two bundles of Agaul cane, which he had brought down with him. They were both exactly twelve months old. At the time of planting he had put some superphosphates with it, and the cane was planted in a fairly heavy soil. One part of the field was shaley, and he wished to see whether that cane would be suitable for the heavy soil of which his farm was mostly composed, and whether it would do better or as well on the shaley portion. The one bundle, which was very tall and with good thick stalks, had been grown on the better part of the field and had had the same treatment as the shorter cane in the second bundle, which was grown on the shaley portion. During the cold months he put a fairly heavy dressing of kraal manure on to keep it warm. It did not come ahead much until September. In October, after he had put on a small dress-

ing of superphosphates and potash, it shot ahead. He thought this cane would be more suitable for the soft sandy soils than the hard black soil which most of the planters had in his district.

Mr. Piccione asked whether the cane Capt. Greig had shown them was not similar to Uba.

Capt. Greig replied that he knew nothing about the cane beyond the fact that one day he was passing through Mr. A. S. L. Hulett's farm and noticed a cane which had a very much greener appearance than the others. On asking Mr. Hulett what it was he was informed it was Agaul, and he had been presented with a wagon-load of it, from which he had grown the cane now exhibited. It was extraordinarily like Uba, but was much more brittle, and was more difficult to reap.

The Chairman thanked Capt. Greig for his interesting paper.

Cultivation of Cane on Flats.

(Paper by Mr. F. PICCIONE, Umhlatuzi.)

I will endeavour to detail here some observations which I have made on sugar cane growing on the Umhlatuzi Flats of Zululand. In doing so I do not pretend to pose as an expert, or anything of the kind. I present this paper merely as the views of an interested observer.

Soils.—The soils are of an alluvial deposit of great depth and have been formed, and are continually renewed, by the overflow of the Umhlatuzi. They vary considerably in quality, owing apparently to the deposits of sand from the river. The lower level soils, especially those approaching indigenous forests and papyrus and kooke grasses, when drained are the richest and yield maximum crops.

Floods.—These alluvial lands have in many ways suffered tremendously from floods which have occurred with remarkable frequency. These devastating floods are the planter's greatest enemy, and a source of great anxiety. Harvesting of crops has been held up, crops destroyed, fields scoured out, especially where cultivation has been practised, huge unfertile sand deposits have been dumped all about, and in cases farms have been cut in twain by the river changing its course. Fear of its recurrence has resulted to a large extent in cases of little or no interest being taken in cultivation by imple-

ments, as stirred-up soils are usually washed away and the cane stools left standing on ridges out of the ground.

The ploughing out of old ratoons has been delayed largely on this account. The results of these river floods reflect on the tonnage returns to the mill. In the earlier days, the "flats" were producing approximately 100,000 tons of cane per annum. These figures gradually fell to 62,000 tons in 1920. Since these floods have given us a period of rest, confidence in the flats is being restored, and ploughing out and cultivation by implements is going on to a greater extent than ever before.

Harvesting.—The practice is to cut half the farms annually, exactly as is done on the hills. Earlier cuttings from favoured fields (which were previously cut in the best months) take place occasionally on some farms. I mention this because of the statements one often hears that twelve months' old canes are cut. The tonnages per farm average from 3,000 to 4,500 tons of cane per annum. All canes are trashed by burning in situ in the early mornings, and the mill gets delivery of the canes the same days as they are cut. Burning is carried on because it is considered economically sound practice, the