

REPORT OF COMMITTEE

ON

CANE PLANTING & CULTIVATION

This Committee set itself to consider ways and means of cheapening the cost of growing cane.

It was thought that it might be an aid to its investigations to collect information as to the cost of producing cane under present conditions. A questionnaire was prepared and sent out to all planters' associations and large estates asking for particulars of the cost of all field operations practiced in cane growing, together with the various other expenses on the cane farm usually grouped together under the designation of overhead expenses. For various reasons, no doubt, this questionnaire met with a very poor response, and the Committee, in framing its recommendations, had to rely almost entirely on the knowledge and experience of its own members.

They were unanimously of the opinion that the only way to reduce costs generally and to an appreciable extent was to increase the average yield per acre. To prove that this was easily possible, taking the sugar belt as a whole, cases in point were mentioned within the personal knowledge of members of the Committee. Farms that had been giving just "ordinary" yields formerly had been worked up to give returns considerably above the average, by an energetic new owner employing thorough methods of cultivation both before planting and during the growth of the cane crops.

It was felt that the most useful thing the Committee could do this season would be to give in this report the general principles, which, in their opinion, ought to be followed in planting and cultivating cane on old cane lands so as to get the maximum crops possible. It must be remembered that these are only general principles and that their application will require careful consideration and adaptation to meet the conditions on different classes of lands and in varying seasons.

There is no easy road to Success in cane planting any more than in other classes of agriculture. The farmer, who gives constant attention to arranging his work so as to get a maximum of result from a minimum expenditure of labour, and who is an

opportunist, in making the most of rains when they come, as well as in other ways, which will readily occur to the mind of the practical man, will always obtain better and cheaper results than one who endeavours to work to rule no matter how excellent his time-table may appear in theory.

It is realised that many cane planters will say that some of the recommendations given in this report are counsels of perfection and that the planter, who is obliged for more than half the year to deliver his daily quota of cane to the mill, cannot afford even to attempt to carry them out. The Committee asks planters seriously to consider whether they can really afford not to endeavour to give their cane crops the best possible chance.

The Committee feel that on many estates where the average crop has been running round the 20 tons per acre per cutting mark, it could be easily raised to nearer 30 tons by better management and more thorough cultivation at a very moderate increase in the cost per acre and with very profitable results to the planter.

The principles and practice of cane planting and cultivation will now be discussed in their natural sequence.

Preparation of Old Cane Lands for Replanting:

It is felt that in the vast majority of cases old cane lands ought to be given one year's rest before replanting. Heavier crops can be expected after the long fallow more than sufficient to cover the cost of leaving the land without cane for a whole year. In practice it does not always mean an extra year because where only a short fallow is taken planting is frequently done very late and part of the season lost. With the long fallow on the other hand planting can be done early.

The long fallow allows much of the work of preparation to be done during the off season. The trash has time to rot and become properly mixed with the soil before planting.

A green manure crop can be grown and ploughed in with advantage. A really good tilth can be established so that the actual work of planting is made easier, the young cane comes away quicker, and much less weeding and cultivating is required before the cane covers in.

Furrowing Out:

Running lines up and down steep slopes is to be avoided, but a moderate slope on lines is advisable.

Where the slope of the ground will permit the lines ought to be straight and set out at a uniform distance apart. Lines ought to be made as deep as possible, and when necessary cleaned out by hand.

Drainage:

Good drainage is essential to the successful growth of cane, and where lands do not drain naturally, much work can be saved by laying out the necessary drains before planting and using the plough for loosening as much of the soil as possible.

Fertiliser:

As has often been stated, the dominant need of Natal soils is phosphatic fertiliser, but many, probably the vast majority of old lands give profitable response to the addition of both potash and nitrogen.

It is advisable to use a mixture that has been proved by experience to give good results. When in doubt apply to the Experiment Station or to the School of Agriculture, Cedara, for advice. It is a good deal cheaper to buy the single ingredient fertilisers, such as superphosphate, rock phosphate, basic slag, chloride and sulphate of potash, sulphate of ammonia and nitrate of soda, and mix them as desired on the farm rather than buy ready mixed cane fertilisers.

The best quantity of fertiliser to apply per acre is still a matter for experiment, but it is an undoubted fact that good land will give a profitable return for larger dressings than can be economically used on poor lands, as a general rule.

Plant Cane:

Any well grown, vigorous cane, free from streak disease, is suitable for planting. Usually the best cane available is plant cane or first ratoons about 12 months old.

Planting:

Use the amount of cane which experience has shown to be necessary to obtain a good stand. As cane planted early in the Spring usually comes away more evenly than that planted later, less seed cane is necessary for early planting.

There does not appear to be any better method of planting than to lay the cane long in the furrows and cut it up there, with a cane knife. It is considered best to cut it up into short lengths of about a foot or even less.

Covering Up.

Good covering up is very important as it may help germination very much. As a rule, the hoe is the best implement for covering, though in well prepared soils various animal drawn implements have been successfully used. Under skilled supervision, such implements might be distinctly economical, but their indiscriminate use cannot be recommended.

Cultivation of Plant Cane:

The cultivation of cane from the time of planting till it has become too thick and tall to work in any longer serves two purposes:—

It kills weeds and it increases the productive power of the soil in a number of ways. It is well known that it assists in conserving soil moisture by forming a mulch of dry soil on the surface. It is also known that it allows air to circulate in the soil more freely and that this has a beneficial action.

There are probably other ways in which cultivation helps the plant. The essential fact which has been proved many times is that constantly stirring the soil round young plants encourages them to vigorous and healthy growth.

With young cane it is desirable to begin this stirring process as soon as possible after planting. Harrowing with a light drag harrow, working up and down the cane lines, has been successfully practised to a limited extent. This practice seems only suited to very well prepared fields. Where there are clods or big old cane roots the harrow is too much inclined to gather these on top of the young cane rows.

It is much cheaper to cultivate with implements drawn by animal or motor power than by hand, so the cultivators ought to be put in as soon as possible and kept going often enough to prevent any hand work being necessary except in the actual lines of cane.

Cultivators ought not to be used when soil is wet enough to puddle, but should be put on immediately the land has dried sufficiently to crumble up after every rain.

It is generally desirable to go through young plant cane with the cultivator at least every ten days when possible for about three months or till the cane has grown too big.

It is not proposed to discuss the different kinds of implements used in cultivating cane lands. There are many kinds of implements doing good work when used properly. It is only desired to say that it pays to look after implements well.

The Cultivation of Ratoon Cane:

The principles underlying the cultivation of ratoon cane are the same as those that have been discussed for plant cane.

Where the cane has been trashed it is recommended that the trash be gathered into every second or every third line. Where cane has been burned all trash can be put in about every tenth line. The lines from which the trash has been cleared can then be ploughed. This may be done in several ways, the best method depending on the nature of the soil. On some soils pony ploughs are sufficient; in other cases heavier ploughs are preferable. In all cases it is recommended to plough the furrow away from the cane towards the middle of the row. Follow the plough closely with either a disc harrow or cultivator to break up the furrows. Some farmers find that a pony plough or other mouldboard plough, from which the mouldboard has been removed, does very good work between the lines of

ratoon cane, going deeper than in ordinary ploughing. Such an implement may be used without previous ploughing or after the surface has been broken by a light pony ploughing.

Ploughing in ratoons ought to be done as soon as possible before the young cane has started to grow so as to allow a more thorough job to be done without injury to the young ratoons.

The cultivation of ratoons ought then to be continued as advocated for young plant cane till the crop is too high to work in.

In conclusion, it is desired to express appreciation of the progressive planters who have proved that these methods are profitable and to say a word of encouragement to those who are trying to follow their example. It is certain they will never regret it.

Committee on Cane Planting and Cultivation:—

H. L. GARLAND.

F. E. GREIG.

J. MARTENS.

M. B. SMEATON.

R. G. T. WATSON.

P. FOWLIE, Convener.

April, 1930.

Tea Interval, 11 a.m.

At 11.15 the Conference resumed.

CHAIRMAN: I think you will agree that this is a very valuable document for the cane planter, and I am sorry there are so few planters here this morning, although they were particularly invited to be present. This Committee has prepared an excellent report in the very brief time it has been in existence. I am afraid it is mainly at my instigation that this Association has diverted into the agricultural field, but I hope the results will be considered worth while. At all events it cannot be other than good to have such an excellent report as this put into circulation.

Mr. PALAIRET: I hope you will allow me a little indulgence in this matter, as there are a lot of points in this paper which I would like to discuss. I agree that this Committee have achieved wonders in the face of very great difficulties. In the opening they refer to the questionnaire sent out, and say it has met with a very poor response. I would like to touch very gently on the reasons for this. As far as my own section is concerned I have been trying to collect some of the information required, and have met with two big difficulties, one being an unfortunate one. The position is this: This Industry is now a rationalised industry and you have a political aspect, as I may call it. Owing to this

rationalisation the allocation of profits between mills and planter is controlled by costs. One must expect both the miller and planter to be very critical in publishing his costs, and it is a little unfortunate that the questionnaire gave planters the feeling that they could not send any information without giving their total costs, which, naturally, for many reasons they would be unwise to do. In a way it is a pity that this Committee took such a wide aspect. We might, I think, have got better results if the overhead costs had been carefully omitted, because I do not think there is any scientific advantage in stating the overhead costs or the total costs of production. The real value is in getting all the details of one method as against another. It would be extraordinarily helpful if planters could get at their detailed costs. But very, very few indeed are in a position to say that ploughing costs so much per acre, or that it costs so much to plant, or so much to reap, and from that point of view the figures could not be given, but I do think this question is undoubtedly one in which such costs should be got at so that they might be reduced, and I feel that this Committee should continue—I believe the Convener belongs to a race which is not unrelated to the one which produced the great spider expert (Robert Bruce), and I hope the principle on which the Committee proposes to work will be adhered to, and that they will climb away and get at the questions of planters' costs on certain items. In this respect I would like to make a suggestion. In the

report they have hammered away at the crux of the whole thing—cultivation. I think every planter will agree that in nearly every case there is inadequate preparation of the soil, but there is a reason for it. The standard to-day more or less is the ox, and on very few cane farms is there adequate grazing for the number of oxen that are really necessary. When you come to the question of ratoons, undoubtedly the method of breaking the land immediately after cutting is the correct one, but you will find very few planters who have got sufficient animals to do it with. Their stock are carting cane, and in almost every case the planter starts his season with the expressed idea that he is going to do it this year. He says, "I am going to break into that land the moment I cut it," but at the end of the season he has not done it, so that the next question he has to consider is, whether he shall replace the oxen with mules or tractors. Now here is where I was hoping for valuable information from this report. I have myself pretty accurately got at the costs of the ox-wagon, and I want to know what it costs to-day with mules and with tractors? I am sorry this information is not given in the Committee's report. So far as things of that sort are concerned, and especially the tractor or the motor lorry, the engineering world provides us with some very valuable empirical data, from which you can make a reasonable estimate of what a thing should cost, but that is not to be compared with the figure for actual costs, and I do feel that this Committee should continue and perhaps make a speciality of that point. I do not think there would be any difficulty in getting from the planters, or the miller-planter, figures showing the number of animal-days and man-days worked, the number of animals kept, the amount of work done and the costs in labour and in overhead charges relating to the animals or the machinery itself, which would give us the specific costs of ploughing and cultivation and transport. Now, if that is done, I am quite convinced from my own calculations that we shall find the tractor not above the cost of the ox, and possibly less. Now if you compare the quality of the work, which after all is the thing that controls your production, I think there is no doubt at all that the results will be in favour of the tractor every time if the lands permit. But I think you will find that nine out of ten planters are scared to take on tractor work because they are frightened of the cost. If you have a tractor it is easy, I think, to get at your average, but if you have livestock it is outstandingly difficult. It means you have to get a big herd of mules. As far as I can see the mule is going to be far more costly than the tractor. Unfortunately the average planter does not look at it in that way, but in time he will have to study and actually work out the costs of the different methods before he makes his change. The miller has called in the scientist because he has been obliged to, and I think the time has come when the planter will have to do the same. We are taking our place in the world's markets, and we have to bring our costs

down. Most planters work by rule of thumb, and with the price of cane as it is to-day the rule is generally thumbs down. There is another important question mentioned in the paper, and that is fertilisation. The Committee especially mentioned nitrogen. Recent experiments at Rothampstead show that there is a very extraordinary correlation between the nitrogen content of the soil and its humus content, and that appears to be entirely unaffected by the application of chemical nitrogenous manures, so undoubtedly here either hand trashing or the burying of trash, and better still, green manuring, are probably going to be the biggest factors in our nitrogen question. I am not suggesting we shall discontinue nitrogenous manuring. Many are putting nitrogenous fertilisers on soils which have not any humus. It is a most costly thing and they ought to have some factor to guide them.

CHAIRMAN: I referred a little while ago to the paucity in the number of planters here, but I think it is evident Mr. Palaret may be regarded as a host in himself, and I am sure the planters could hardly be better represented than they have been in the excellent criticism and comment we have heard from him. I think this difficulty in regard to the replies to the questionnaire is not confined to the sugar planters in our own Industry. When I was present at the meeting of the Agricultural Section of the British Association in Pretoria last year, there were several papers read on Agricultural Costs, and it was mentioned by several speakers that there was a difficulty in getting reliable costs, or even any costs at all from the average farmer, and there are many reasons that will naturally occur to you why that should be. The planter or farmer often feels that his time is much better occupied in the fields than in keeping many books. Within certain limits that may be so, but on the other hand statistical information is necessary for the proper understanding and proper progress of any agricultural industry; such figures must be obtained in some way or another if progress is to be made. With reference to the point Mr. Palaret raised about fertilisers, there is no doubt that the ratio of carbon to nitrogen in the soil has a very important bearing. We are carrying out some experiments at Mount Edgecombe at present on which it is rather early yet to report, but there does seem to be an indication that soils which are very deficient in organic matter will not respond for some reason or other to nitrogenous fertilisers; at all events in a mineral or highly concentrated form; the problem therefore resolves itself into a question of increasing the organic content of the soil, and thereby increasing its response to nitrogen or even automatically increasing its nitrogen content. It is remarkable that in certain soils of the type I mentioned, which do not respond to nitrogenous fertilisers in the ordinary way, the benefit of green manuring with some non-legume which affords no nitrogen has surpassed the benefit of the legume

actually drawing its fixed nitrogen from the air. It looks as though, if we look after the organic matter the nitrogen will look after itself. Perhaps that is a crude way of putting it, but there is something in the idea as applied to our lighter soils at all events. With regard to the report itself, I would like to have seen the Committee express more definitely their views regarding the quantity of cane necessary for planting. We have a short paper on the agenda on this subject, and we have found at the Experiment Station that under our conditions with a well-prepared soil and careful selection of planting material, it is not necessary to use more than one continuous stick for planting, even when planting late in the season. Whether that is the general experience of planters remains to be seen, but we feel sure there could be considerable economy brought about in the use of planting material.

Mr. BOOTH: Mr. Palairet referred to Mr. Fowlie as a member of that race which bred Bruce's spider. I understand the race is very canny, and in this respect are very careful of what they say or write. They say in their report that where the average crop has been running round the 20 tons per acre per cutting mark, it could be easily raised to nearly 30 tons by better management and from thorough cultivation. Our sugar crop this last year was 300,000 tons, and if the recommendations of this Committee were carried out, speaking generally, we would get about 400,000 tons, and the price under the Fahey Agreement will come down to 10/- a ton. I would like Mr. Fowlie to elaborate this point.

Mr. FOWLIE: When my Committee discussed our report and decided to ask planters and estates to oblige us with facts concerning their costs, we hoped to be able to get together at least enough data to be able to make some comparison (as Mr. Palairet pointed out) between the cost of the different operations carried out in different ways. I hoped it might be possible to show that, under these new conditions, with the price of cane so low, although it might not be possible to obtain the same average profit per acre as formerly, it would be possible to increase the yields of certain lands enough to make these lands still profitable. And, on the other hand, that there are other areas under cane at present which under the present circumstances cannot be expected to grow cane profitably at all, and that probably the way to success would be to grow more on our best lands and leave our poor ones out altogether. I am sure, even on individual estates, a good deal of that might be done with advantage to the owners. Their only hope is to grow a bigger yield, and if necessary cut out the areas that won't produce a big yield. That is my personal opinion. We did not go into that aspect of the matter as it turned out in the end. We were perforce compelled to go back to the general principles and do the best we could with the material

at our disposal. This report was written to express the views of the Committee, and there were certain points (and this point Mr. Dodds brought up about the quantity of cane to use for planting was one) on which we were not all agreed, and the opinions expressed had to be such as all the members of the Committee could subscribe to. As regards the cane required for planting, we have proved at the Experiment Station that single stick planting, as it is called, is generally sufficient under good planting conditions where the cane has a chance to grow readily and well. Many planters feel that when planting up everything as it comes, sometimes the conditions are good and sometimes bad; sometimes the weather is right, and sometimes not; it is safer to put in more than is necessary in the hope that enough will grow to make a stand, and if too much grows, it will crowd itself soon and the stand will be just the same. We cannot say very much with certainty, but it does seem better to use enough seed cane to get a stand without replanting blanks rather than to use so little that the blanks are considerable.

Mr. PALAIRET: As far as the individual planter is concerned, taken on an average, the reaping cost and everything connected with it from the cane in the field to the mill is about 5/-. That leaves, on the Board of Trade estimate, 10/6 a ton to cover all agricultural work and all overheads. Obviously, if we could increase our production by 50 per cent. we would make a saving of 1/3 of that which is 3/6 a ton. That is to say, if the planter without any increase in expenditure could extend from 20 to 30 tons, he would be producing his cane at a cost of 12/- instead of 15/6 as at present. But supposing we say, as a result of intense scientific study, we make that increase, there is a possibility in the future that the planter will get his costs down to 13/-. How does that stand? At the world's price to-day cane is worth 12/8 to the planter. If our hopes are realised the world's price next year may go up; possibly approaching its normal. If it does, there is a possibility that if we go into this question we may get our costs below our export price. I do not suggest for a moment that we shall do it—I do not think we shall—but we probably can do it, and it is up to the technical side of the Industry to get us there, and if we do get there the prospects are exceedingly bright.

CHAIRMAN: With regard to Mr. Booth's remarks, an increase in the production of cane per acre does not necessarily mean an increase in the total output. It all depends on whether the same area is under cane or not, but in any case what the increase in tonnage per acre does mean is reduced cost of production per ton, and I suppose that is what we are out to get. With regard to another point that has been discussed, if I also might touch very gently upon it, I would like to say with regard to the replies of the questionnaire, that we must not forget that this Technologists' Association is a

wing of the Millers' Association, and this questionnaire was sent out under the aegis of the Millers' Association, and although this Committee, as Mr. Booth has pointed out, is a Committee of planters and field men, all planters may not realise, that information sent to this Committee in the ordinary way does not get to the millers until it is issued to the general public; and having regard to the difficult relations in existence at the present day, one can readily understand that neither wing of the Industry is anxious to give anything away. However, that is a matter that will, I feel convinced, cure itself in time, and no doubt this Committee has made an excellent beginning, even without the information that they hoped to get regarding existing costs and practice.

Mr. BOOTH (rising on a point of explanation) said: I am not altogether ignorant of planting costs, and I have had that work in my charge before. I did start on the gentle art of leg-pulling, but I think it is rather an incautious statement to put down things which are liable to be quoted for the income tax. I still, however, charge Mr. Fowlie with having departed from his national tradition.

Mr. FOWLIE: I am sorry none of my fellow Committeemen are here to share the blame, but I will take my share any way.

CHAIRMAN: If there are no more comments we will pass to the next business.

A hearty vote of thanks was accorded to Mr. Fowlie and the Committee for their excellent report.

CHAIRMAN: The next two papers are from the Experiment Station. These are unsigned for the reason that although the compilation of the reports and the interpretation of the results have been written either by Mr. Fowlie or myself, yet the work as a whole is an example of the team work of the Experiment Station, for which I think the whole of the staff concerned should receive credit. One of the papers you will see deals with a matter which has been already referred to and discussed in the report of the Committee on Cane Cultivation; that is an experiment in cane planting using different quantities of cane for planting per acre.