

Green Manuring for Sugar Cane.—Contd.

At the conclusion of Mr. Dodds' paper the Chairman said:—

"We have had two lecturers who have shown us that we don't know how to grow cane, and I must admit there is a good deal at the bottom of it. I think the Natal men all these years have been on the right track with their trashing, otherwise they could not have expected to grow cane for fifty years on the same ground. Of course I know we don't all hold the same ideas in Zululand, but we are living on our capital I am afraid and we are going

to pay for it bye and bye (hear, hear). There is no question about that. It is not a personal opinion, it is a fact. These gentlemen have shown you in how many ways you could find a green manuring crop to suit any condition of climate, time of the year and soil. We have not much time left to-day and as the majority of the questions you would ask are on the agenda for to-morrow you can ask all the questions you like to-morrow. I will just ask you to join me in a vote of thanks to Mr. Edelman and Mr. Dodds for the very interesting and enlightening papers they have given us (loud applause).

APPROXIMATE METHODS OF FARM SURVEYING.

(Address by T. A. WARNER, Government Land Surveyor.)

It seems a very far call from green manuring papers to one on such a different subject as surveying, but from remarks which were passed at lunch I think it was brought home to us how necessary it is to get a little more accurate data in connection with the work which we do, not only in our factories, but also on our farms, so that we can get comparative results and know from the financial point of view whether it pays us to do certain experiments which may appear to our scientific friends to be very nice. We want fairly accurate figures as to whether they really pay or not.

From the farmer's point of view the first problem he is faced with is the one of being able to accurately lay off his farm and know the area of his fields. This particularly applies to sugar, where you have comparatively speaking a crop of great value per acre, probably more so than most other crops, and so from the sugar planter's point of view this matter is rather important.

There is another aspect of the problem, and it is really one of the reasons that has tempted me to inflict you with this address to-day. In my professional experience I have unfortunately lately come across quite a number of cases of rather serious disputes between buyers and sellers of farms as to the acreage of the cane existing on their farms. At the present time I am interested in two cases which I am afraid will go to the Supreme Court and you know what that means. I am quite satisfied in my own mind that in none of these cases has there been any deliberate attempt on either side not to give accurate figures. The position has been that the people have not sufficient knowledge to really know what acreage they had. They thought they had it but they find they had not. I don't want you to think that I am going to give a talk on surveying so as to pass Government standards for purposes of transfer, but if I can show you a simple

way by which an ordinary person of average intelligence can measure up his fields to within a reasonable amount I hope that will be of some value to you (hear, hear).

Fortunately on the coast of Natal our lands are not very highly mineralised particularly with regard to iron, and therefore we are able to make full use or could make full use of the prismatic compass. Many people bring me problems and ask me to give them the area of their fields, and they give a whole lot of measurements and ask me to tell them what the area is. Now that is a physical impossibility for anybody to do and I think where the average person goes wrong is that they put a great amount of stress on to the actual measurements, that is to say the lineal measurement, without taking any account of the angular measurements; the one is just as important as the other.

We should try to retain our unit of measurement and that is the link. In towns and places where a lot of building has to be done gradually the foot method of measurement has ousted the link, but people to-day are beginning to think a good deal more than they did with regard to link measurement; it is the one little bit of decent decimal unit that we have in the whole of the British standard of Weights and Measures. It is very simple and easy and I cannot understand why it is not used more than it is.

There are 100 links in a chain, the equivalent of which is 66 feet. The advantage is that there are 100,000 square links in an acre. If you are measuring up a field and you can reduce it to a parallelogram it is quite simple. In links 500 by 200 equals 1 acre; 600 by 400 equals 2.4 acres, etc. I will give you a few examples (demonstrates on blackboard). There is only one figure of which you can get an accurate area by linear measurement and that is from the triangle. On level ground as in the Orange Free State and Transvaal fields are gen-

Approximate Methods of Farm Surveying.—Contd.

erally laid out rectangular parallel and then by dropping perpendiculars from one side to the other the necessity for taking angles is not so great, but with the irregular shaped hills, contours, streams, roads, and so on in this country it is practically impossible to get a reasonable idea on average farms of the areas of your fields unless you take the angles.

As I said before, fortunately our soils and lands not being very highly mineralised you can use the prismatic compass along the coast belt and within reason it will give you very accurate results. I would strongly advise anyone who is particularly interested and wishes to get the areas of his fields to use a prismatic compass for the angles. It is cheap—

afterwards which is the difficulty. Of course this is a business in itself and it would be absurd for me to attempt to demonstrate to you all the ways in which the areas of figures are obtained exactly.

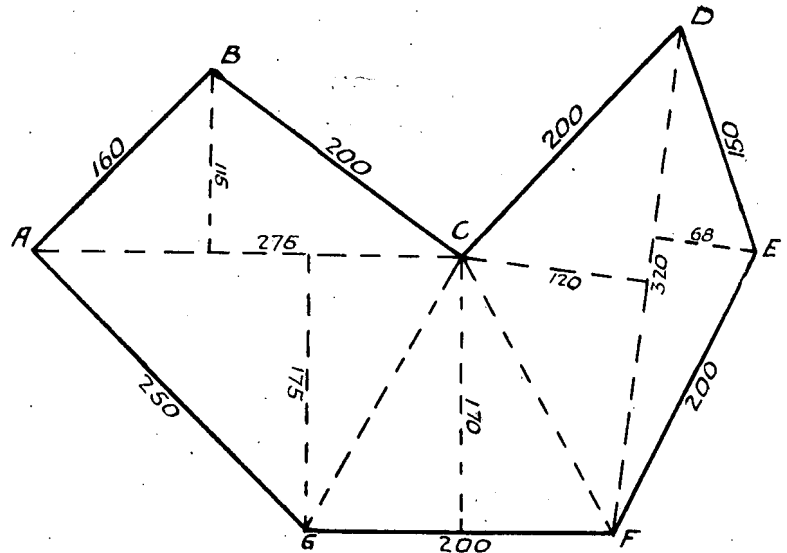
You can get what you want with very little calculation. Presuming that you have done as I suggested and gone round with your prismatic compass and taken the angles and measured the lines with the tape, the simplest way to get at the areas is to plot your field work on paper to a fairly large scale; then divide the figure up into triangles or parallelograms; scale off the lengths of the lines and then work out the areas of the triangles (see diagram).

Sketch Plan of
Field A.B.C.D.E.F.G.
Scale equals 100 Links equals 11 inch.

Area			
ABC	equals	275x115 equals	.31625
AGC	equals	275x175 equals	.48125
GCF	equals	200x170 equals	.34000
DCF	equals	320x120 equals	.38400
DEF	equals	320x 68 equals	.21760

2 | 1.73910

.86955 Acres.



you can buy a prismatic compass for a few pounds. A cheaper way of course is to get your neighbour to buy one and borrow it. (Remark "that is true co-operation" and laughter). As you know a circle is divided into four right angles of 90 degrees each, otherwise 360 degrees around the circle. To get an angle with the prismatic compass you sight through the prism, wait until the needle settles itself, and then read the angle on the edge of the circle. That gives the magnetic bearing of the line which you are taking. You then do the same thing on the other line and the difference between the two bearings is the included angle.

With regard to chaining, so far as survey work is concerned all measurements are reduced to the horizontal, so if you are chaining down steep ground a plumb-bob is necessary. Some people have an idea that there is very much more area of land in a hill farm than there is in a flat farm, for the reason that surveys are all reduced to the horizontal for survey work. As a matter of fact in practice the difference is very small except on extremely mountainous ground. To many people it is not so much the taking of the measurements as the working out

Some little time ago there was a dispute over the area of a farm, and two surveyors were concerned. A survey was made of the fields of the farm by the methods I have described to you to-day and the areas taken out as I have shown you. The people interested were not satisfied and the other surveyor was called in and an accurate theodolite survey of the whole area was made. The first man's work took a day and the calculating and planning took another day. The second man's work took a fortnight, and at the finish the difference in the result was half an acre in an area of 397 acres. Those are results which were actually obtained.

There is another instance: an estate had been surveyed into large areas of about 200 acres in each block by the methods I have described to you. It was necessary to go over these again and put in smaller subdivisional fields. One block was tested out and on a block of 200 acres when it was re-marked out into nine fields the difference was half an acre. Of course that is not accurate surveying and is not meant to be, but for the average farmer it is as near as he is likely to get in the ordinary way.

Approximate Methods of Farm Surveying.—Contd.

Another reason for a fairly accurate farm plan is that it unfortunately happens with a number of sugar farmers that for various reasons they have to get valuations made of their farms (laughter). I don't wish to convey the slightest suggestion that I am in any way belittling the value of the valuator we have to-day. A careful valuator in making a valuation of a farm generally puts a little footnote to the effect that "the areas and quantities are those as supplied by Mr. —." He covers himself in that way naturally; he is not a surveyor and has not the time to measure up all those fields. In his valuation he covers himself by saying that he has accepted the figures with regard to area.

What he is really doing is giving the value of the cane on the area supplied to him by the party owning the farm. From a valuation point of view that may be alright, but it all hinges on the point that the areas may be right, and if the areas are not right you probably find that those valuations are not what they ought to be or what the valuator would make them had he the proper plan of the farm before him and knew the exact area of the fields. For that reason alone I think it is worth the consideration of the average farmer as to whether it would not pay him to get the area of his fields and a general plan of all his farm or estate made out reasonably accurately. (Hear, hear and applause).

Mr. D. L. Patrick: We have had a most interesting talk from Mr. Warner and I must say he got right there. It has often struck me as peculiar that although we weigh our cane on a weighbridge to the last pound when you come to the land on which it is grown very few of us have any accurate figures in regard to that part of it. You may be 10 per cent. 20 per cent. or even 30 per cent. out in your calculations. How can you arrive at your tonnage per

acre if you don't know your acreage? There is not the slightest doubt about the correct way to do things. The method demonstrated by Mr. Warner is an extraordinarily simple one. It is a subject that the majority of us have fought shy of. We don't even know the exact acreage of some of our fields. It has been handed on to us and we have kept it and guessed at it. We owe Mr. Warner a hearty vote of thanks for his paper. (Applause).

Now I would like to ask Mr. Warner a question. The method of measuring is correct, but as a surveyor I would like to know where he would start with his measurements if he was surveying a farm for litigation purposes. Would he take it from a point on the outside of the field equal to the centre of the space between the cane rows, or would he start right up against the roots of the cane in the outside row?

Mr. Warner: I am glad that was asked because it helps to illustrate the need why an approximate method is all that is required for ordinary measuring up of cultivated lands. You will get quite a lot of controversy as to where a field ought to start and end. As a matter of fact you have no definite line. It is a matter of give and take in taking the reasonable acreage of the cultivated land. It helps to show that a very accurate method of survey would not only be expensive but would not fulfil the object for which it was done, for the simple reason that you are not working to definite marks as in the case of land surveys where you have beacons and land marks to work to. I should say that a reasonable point to start from would be at a point on the outside of the outer cane rows equivalent to the centre of the space between the rows. The edges of the fields are more or less irregular and the approximate methods would give you the result just as accurately as the other.

The Chairman then thanked Mr. Warner for his address. (Applause).

ANIMAL TRANSPORT ON SUGAR ESTATES.

(Paper by V. C. SCHWIKKARD, Field Overseer, Sugar Association Experiment Station.)

In common with other branches of the Agricultural Industry of the Union the question of Agricultural Economics plays an equally important part in the production of sugar cane, and planters are seeking ways and means of reducing the cost of production of cane per ton without impairing or reducing their general efficiency.

While it is generally agreed that the cost of Native Labour provides the highest proportion of the cost of production it will be found that the cost of draught animals forms a proportion almost as great.

As a result of the cost of production of maize in-

vestigations it was shown that the cost of ox labour formed 17.7 per cent of the gross cost of production of maize; more than one sixth—and the cost of draught labour in the production of cane does not appear to be any less; it is probably higher. In the absence of any reliable figures giving the cost of production of cane per ton in detail it is impossible to show, with any degree of accuracy the cost of draught labour beyond indicating that this cost forms a comparatively high proportion of the whole.

Of the various types of animal at present em-