

# Report of the Committee on Sampling Cane for Sucrose Tests



Committee:—P. L. DRAEGER, G. BOOTH, G. S. MOBERLY (*Convenor*).  
(*Being a Sub-Committee of the Committee on Standardization of Chemical Control*)

Mr. Moberly read the following paper:—

## GENERAL CONSIDERATIONS.

In order to facilitate and expedite the taking of individual samples it is necessary that the layout of the mill yard and the unloading devices should be designed with this end in view. It is realised that it is not feasible completely to re-design the mill yard, etc., in existing mills, but certain recommendations are made for guidance in making future changes.

## EXTENT OF SAMPLE.

Since it is imperative that each sample should be as representative as possible of each consignment, it is recommended that a sample be not less than 75% of the weight of any consignment on any one day, and should be not less than 10 tons of cane.

## UNLOADING DEVICES.

It is recommended that where there are more than one carrier, each should be served by a separate unloading device, so that on each carrier there shall be no danger of mixing cane from different consignments.

Where S.A.R. and narrow gauge trucks are unloaded on to the same carrier the unloading devices should be adequate to deal with either type of truck separately.

## CANE TRUCKS.

Wherever possible narrow gauge cane trucks should have a covered bottom, to assist the rapid unloading of the last portions of cane, and for the same reason the grabs should be so designed that they can pick up cane lying in the corners of the trucks.

## SLINGS.

The use of slings greatly facilitates the handling of cane, especially where this arrives at the mill in wagons.

## WEIGHBRIDGES.

It is recommended that at each mill the weigh-

bridge should be placed as near as possible to the carrier for the following reasons:—

1. To assist in the marshalling of trucks into samples before weighing.
2. To reduce the time during which changes in the weight of cane may be brought about by evaporation or rain.
3. To reduce the amount of cane between the weighbridge and carrier at the end of the crushing period.

This change would necessitate a larger weighing staff, as weighing would have to be continuous during crushing, there being no reserve of weighed cane on hand.

## AUXILIARY CARRIERS.

While the use of auxiliary carriers is a great aid to sampling it is felt that this would be a retrograde step from an engineering point of view, and is not to be recommended.

## IDENTIFICATION OF SAMPLES.

The Committee is of opinion that a uniform method of identifying samples and checking their correspondence with weight and tests is necessary. The following scheme is suggested. The weighbridge checker should hang on the front truck of each consignment a tin disk on which he would chalk the name of the planter and the number of trucks in the consignment. The cane tester on duty should keep a note book in which to enter the planter's names, number of trucks, and the number of the first and last truck in each consignment. He should also enter the time of crushing and the percentage of the sample crushed. The bucket in which the juice sample is collected should have a dab of black paint on it on which should be chalked the name of the planter. The test jar in which the sample is placed should be marked by means of a tin label bearing the planter's name which could be hung on the lip of the jar. When not in use those labels could be hung on a board on the wall in alphabetical order so that they are easily accessible. In the weighbridge a book should be kept showing the time of arrival of each truck and the number of each truck in every consignment and its weight.

This book should be sent over to the laboratory periodically so that the chemist may enter the weight against each test. In this way every sample can be identified and credited with its true weight and test, and a record kept of the time of arrival and time of crushing, and the percentage crushed.

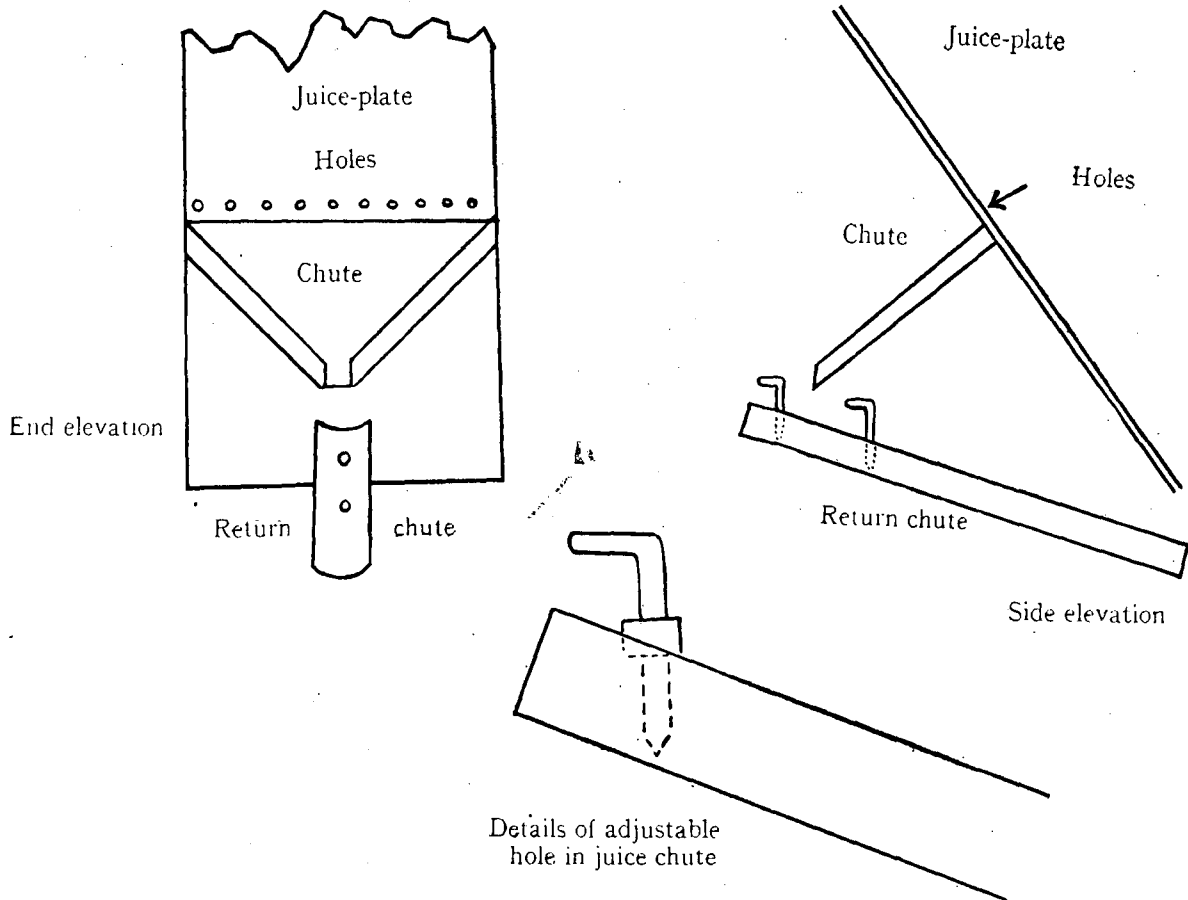
#### SAMPLING OF THE CRUSHER JUICE.

A form of juice sampler is at present being installed at certain mills on the North Coast which seems very suitable for the purpose. A row of small holes are drilled right across the breadth of the juice chute and below these holes is a triangular chute leading into a trough, which in turn leads back under the crusher so that the excess of juice rejoins

the rest of the expressed juice. In this latter trough is a small hole into which can be screwed a tapered bolt, which allows for an adjustment of the quantity of juice which can escape from the hole. Two of these holes with adjusting screws can be placed in the trough, one for the planter's sample and one for the mill sample. These holes can easily be cleared if they become stopped by screwing out the tapered bolt and then screwing it back to its former position.

#### CONCLUSION.

While the above cannot be considered to be the final word in sampling, these recommendations should go far towards simplifying this difficult work.



#### RECOMMENDED CRUSHER JUICE SAMPLER.

Chairman: You will recollect this Committee was only formed in January, so that there has been very little time for it to get to work. The sampling of cane is a matter of great importance especially in view of the system recently adopted of paying for cane on sucrose content.

Dr. Hedley: There is one point with regard to the recommendation of not less than ten tons of

cane sampled. Quite a lot of planters send in only about three tons at a time and it would mean that they could not get samples if that recommendation was carried out. There is also the actual sampling. I don't know whether it would be possible to fit the chute recommended to all mills. I think it would be rather awkward to fit this chute at Felixton. I think much more consideration should be given as to how you are going to get an adequate sample.

Chairman: Do you think it would be practicable to have the device of the tapered bolt?

Dr. Hedley: That is in the return chute.

Mr. Watson: This scheme is already in position at our Darnall factory. I don't know how it is going to work but it seems to me to be quite a feasible thing. With the tapered bolt it will only need a little adjustment to arrive at what is required to get a full sample. I might say it is a Fulton crusher of the same type as at Felixton.

Mr. Moberly: With reference to sampling only three tons, of course, that recommendation would have to be modified. As Mr. Watson says this scheme is in use at Darnall and that is where I got it from. It struck me as being quite adequate for the purpose. The idea of the tapered bolt is that you can so regulate the flow in that return chute, that your bucket can be filled up in the time required. With regard to returning the juice back under the crusher, if there is any difficulty in the particular lay-out it might be returned into the side gutter. It does not matter how it goes back. There is an almost identical sampler at Empangeni, the difference being that instead of the return chute with adjustable holes in it, the juice flows into a bucket at one side and flows out at the other. The committee were not at all certain that that really was an average sample. We thought this method in use at Darnall would certainly make the sample more representative.

Mr. Bechard: I was at Felixton last year and was in charge of the sampling of the cane so far as the planters were concerned. I was on the committee when this design was considered and I think it is possible to introduce it at Felixton. With regard to sampling 75% of the cane, we are actually sampling more than that at Felixton. We are sampling over 90% and the samplers are adjusted so that we do not get a bigger sample than the mill. As far as the sampling for sucrose content was concerned we had just the right quantity. On the question of deliveries of less than ten tons I think it is fully met by the Fahey agreement; we take about three samples for planters whose deliveries are small.

Mr. Dymond: I asked the committee to go into the question of sampling as we have it at Empangeni. Early in the crop some planters complained that our method was not to their liking because there was large samples and small samples. I illustrated to them in a very simple way by means of coloured juice, that provided you had an inlet and outlet at opposite ends of the bucket, you got a circulation of the new liquid coming in, and I satisfied them that a fair sample was obtained. I myself am not absolutely satisfied that it is a perfect method of sampling but it was the best available at the time.

Chairman: It does not strike one at first sight as being a very satisfactory sampling arrangement. However, if it has been tried with coloured juice it shows it has some possibilities and it might be modified in some way to make it a satisfactory method. On the face of it I would prefer the system outlined in the report.

Dr. Hedley: I think this tapered bolt business is going to necessitate very strict attention to it. I have not seen any small orifice which will not block unless you have some continuous method of cleaning it. You know how filthy the cane is at times. I don't feel that even this is going to be the solution of the juice sample problem.

Mr. Moberly: It is quite possible that this hole is going to be choked up but it will be much more easily cleaned than the method at Felixton. With this it would only be necessary to screw the bolt out and screw it back again. In the same way a tap through which juice flows gets very filthy inside. This can be kept very much cleaner.

Chairman: That is the only obvious objection that occurs to one, the difficulty of keeping it from being choked.

Mr. Pearce: There has been some dispute about the Java ratio holding after rainfall. We are talking about sampling cane at the crusher. I have heard some talk of taking it from the first mill juice. Has anything been done?

Chairman: That is going to be discussed in a paper which comes next on the agenda.

Mr. Pearce: What is the position about taking the sample on the crusher?

Chairman: It may be that the method will have to be modified, but as it stands at present we are under the obligation of devising methods for satisfactory sampling of crusher juice. It might not be the case in the following season.

Mr. Moberly: There is the further consideration that even if we did evolve a method for testing cane without the analysis of the crusher juice we would still have to deal with crusher juice, so that would still have to be sampled.

Mr. Warner: With regard to the 75%, where you have cane coming in with variable fibre content, you crush say 75% of one class of cane and then 75% of another class of cane going through the same openings of the mill. I say that is a hindrance in the extraction and in the capacity of the mill. It might be theoretically right to obtain a correct sample of the juice of 75% but is it a practicable proposition for the millers that that should be done? It may act in several mills where the canes are very much of the same class, but where you come to a

mill that has varying fibre content and so on I think it has got to do with the extraction and capacity of the mill. As to the weighbridge being as close as possible to the carrier, I quite agree with that, but that is a matter that has been battling on for years and it will never be accepted by the planters. We would welcome it as millers to have the weighbridge right over the mill, but it would never be accepted by the planters as they may send in cane on Saturday, and it may dry out before being weighed and they will not bear the loss—but we must. We have always been in the habit of putting the weighbridge further back on the suggestion of the planters.

Mr. Bechard: On the question of the weighbridge the point mentioned by Mr. Warner was applicable before the system of payment on sucrose content under the Fahey agreement came in; it is true that when the planter was being paid on the quantity of cane he was delivering the bigger the weight the better for him. I take it the planters are now going to realise that the weighbridge weights after all do not matter so much. The weighbridge weight at present becomes a distribution figure and the juice scales figures are the most important at the moment. When the planters realise that it is not going to affect them I don't see that they will have any objection to the position of the weighbridge.

Mr. Moberly: With regard to the sampling of 75% of cane in mills where you have different types of cane, that is an admitted difficulty, but as a matter of fact at Felixton last year we managed for a great many months to sample very nearly the whole of each consignment that came in and kept going. I admit that in another year it might be different. The difference in fibre may be so great that it would be impossible to keep the mill going with fuel if you run through a big consignment of low fibre cane. In that case some effort would have to be made to meet the situation, perhaps by dividing up the consignment into two portions, crushing at different times, and uniting the samples. But this difficulty does not always arise as is shown by the fact that we managed to carry on at Felixton last year.

Mr. Watson: In the comparison of factories it is stated this season shows a decrease of 1.56 as compared with 1926. Amatikulu is one of the factories at which the extraction was decreased by 1.5. I put down 50% of that as directly due to the fact that we have to crush every individual consignment of cane by itself. You cannot set a mill to tackle sixty different classes of cane in a day as we have to do at Amatikulu. A fair mixture of cane is what we have always tried to get at the carrier before the Fahey agreement came into being at all. It was our special effort to make a proper mixture of the cane at the carrier to make sure that one setting of the mill would meet nearly all require-

ments. There is another point that has not been mentioned and that is the trouble in clarification when dealing with certain consignments. We will get one coming in with a purity of 83 followed by one of 93. You have your treatment of juice for 83 followed by 93. A general mixture of the juice would make clarification much easier than dealing with wide extremes as we have to at our mill.

Mr. Moberly: These discrepancies are ones which I quite appreciate, but if you do not sample the greater portion of a man's cane he is not going to be satisfied in cases where rejections occur. If it were not a matter of rejection the point would not be so serious because it may be possible to convince some of them at any rate that in the long run the differences would average out. But where there is a danger of small portions of his cane being tested and the whole consignment rejected on that test, nothing will ever convince him that he is getting a fair deal, and he has always the thought at the back of his mind that the untested portion is very much better than the other. Admittedly it may be worse, but human nature being what it is, every planter who had a rejection on 50% sample would be convinced that the other 50% would be the best cane ever sent in that year. That is what was at the back of our minds when making this figure 75%. That is the lowest figure which the planters themselves have decided they could accept.

Mr. Bechard: I quite agree that it is very difficult to handle cane that is continuously varying in composition, but on the other hand probably the use of Dorr's clarifiers would neutralise that to a large extent. It is a question which ought to be inquired into by the committee on clarification.

Mr. Booth: When I was called on this committee, and I wanted to find out what was the actual percentage of cane sampled for the last year, Mr. Moberly told me about 90%. I thought in view of my own work at Umfolozi that this was a very high figure and I had in mind the argument that Mr. Warner has brought up, the effect on clarification in dealing with such large quantities of flats, cane. I have had considerable experience of Australian practice and the conditions there distinctly laid down that 30% of the cane must be sampled. I found that was not sufficient for Natal cane as the variations in sucrose content were so great. A ten ton sample has been advocated as a minimum because I cannot see that anything less than ten tons constitutes a sample at all. In order to protect Mr. Moberly in the various troubles he has, and reduce the friction with his planters, the idea of fixing it at 75% was taken so that the planters would be sure of a square deal. If they could get 90% so much the better. I do think that Mr. Moberly's organisation should be protected by allowing him to say 60 to 75% as a sample.

Mr. Watson: I can also sympathise with Mr.

Moberly in his difficulty. My opinion of the method is that it is tending to inefficiency in mill work. Surely that is to be avoided. It is actually putting a premium on inefficiency. A mill cannot be efficient if you are going to crush every sample by itself. Nor can clarification be efficient if you are going to clarify every individual juice.

Mr. Booth: Mr. Fahey will be here next week. I realise that this matter is likely to be a source of friction between the planters and millers. I think this Association might put it to Mr. Fahey that he should go into the matter with parties from both sides and fix what should be the percentage of cane to be sampled.

Mr. Warner: I would not like it to go as a recommendation from this meeting that 75% should be sampled.

Chairman: It is a recommendation from the sub-committee that was appointed from the standardisation of chemical control. I understand the Chemical Control Committee will have to deal with it. They have not had time to receive and consider this report as yet, but it will come up before them for discussion before any final decision is made.

Mr. Dymond: Does Mr. Warner refer to flat cane or to hilly cane when he speaks of 75%.

Mr. Watson: I have had very little experience of flats cane. Our cane at Amatikulu is all hill cane yet we get up to sixty different consignments of cane in one day.

Mr. Dymond: I asked this question because my experience is just the reverse. The crushing rate is dependent upon the tons of fibre per hour. If cane of low fibre is crushed, your crushing rate automatically rises. This is nothing new and can be substantiated. Regarding the effect on the extraction I cannot believe that a 75% sample is going to make any difference. It is not as though all the cane for the day could be thoroughly mixed and an average cane of a definite average fibre obtained. No, the mixing of cane mentioned consists of the offloading of bundles from two or three consignments at the same time. This is not mixing cane but merely a suitable arrangement owing to

inadequate offloading devices. Mr. Warner says that the average extraction this year has dropped and he puts it down to this fact. No, decidedly no. It is due entirely to the adoption of the methods of chemical control laid down by the Technologists' Association.

Mr. Steward: In connection with weighbridges, the first reason given in the paper is that it will assist in marshalling trucks. I can't see how that would occur. I think the result would be just the reverse. If you have two hundred yards say, of treble or double line between the weighbridge and the carrier, you would be able to get the samples together easier than if you have the weighbridge near the carrier. A planter's consignment in one day does not come in one train but in five or six, and if you have three or four lines you can manipulate the trucks and get the samples together.

Mr. Moberly: You will notice the wording of the report "to assist in the marshalling of trucks into samples before weighing." The idea was that several different lots may come from one man, and you need a certain amount of mill yard space to get them together. At present you have to weigh them separately. If they could be all brought together before they got to the weighbridge and you had all your line before the weighbridge they could be weighed together in one block and simplify the weighbridge work.

Mr. Christianson: As to 75% of the consignment being taken, what is meant by that; are the samples to be taken at one time or 75% in all?

Mr. Moberly: It would depend largely on how the cane comes in. In most cases the consignment will all come in together and the 75% would have to be crushed of that consignment. Where it is possible to collect trucks from different parts of the yard and bring them together that would still be done.

Mr. Pearce pointed out that the report had not come before the Committee of Standardisation of Chemical Control and was only a recommendation to that committee.

At 12.55 p.m. the Conference adjourned.  
Resumed at 2.15 p.m.