

SOME NOTES AND OBSERVATIONS ON THE FIELD TRANSPORT OF SUGAR CANE

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One of the major operations on every sugar farm or estate is the transport of the crop from the field where it is grown to the point where any further transport is no longer the responsibility of the planter. This point is either the locomotive line, a South African Railways siding or the mill yard. Being one of the important features of sugar planting, transport has a big influence on the cost of production and the object of this paper is to discuss briefly, various methods of transport with their relative advantages and disadvantages.

In a large section of the farming industry field transport has, during the last quarter of a century, evolved from the ox wagon stage through the portable tramline stage to the present ever-increasing use of road transport, either by means of lorries or by road tractors and trailers. The ox wagon method is not worthy of discussion as it has now, with a few exceptions, been discarded. It remains, therefore, to present only the portable field line and road transport methods, and in doing so it may be as well first to list the obvious advantages, or disadvantages, of the one method over the other. Let us then consider the advantages of road transport over field line transport. These are set out below, not necessarily in the order of importance, as no doubt mill managers, transport managers, field overseers or the planter will differ as to the importance of one advantage over the other depending on how it particularly affects himself.

Advantages of Road Transport over Field Tramline

- (1) A greater output per loader owing to the shorter distances the cane has to be carried.
- (2) Better supervision of loading as only a few lorries are loaded simultaneously, while, on tramline, a long string of trucks are all loaded at the same time.
- (3) Heavier truck weights, if load is transferred to truck by gantry crane. This increase is as much as 25 per cent., from an average of 3 tons to 3.75 tons per truck.
- (4) Less skill required to load a lorry or trailer, resulting in better use of any inferior type of labour that may have to be employed.
- (5) Larger number of units per gang allows of one or two duds, or smaller boys, to be absorbed in the gang.

- (6) Labour is not kept idle waiting for trucks that may arrive late.
- (7) No night work taking trucks from field to main line.
- (8) No labour expended on laying rails daily.
- (9) No tramline maintenance, such as the replacement of worn rails, sleepers, fishplates and bolts.
- (10) No animal drivers, brake boys, sand boys, etc., required.
- (11) Less draught animals required on the farm with consequent saving of stabling and grazing.
- (12) Grades for roads do not required such uniformity and can also be heavier than for tramline.
- (13) Greater mobility to reap any particular area at short notice, as may be required after an accidental fire or during periods of drought.
- (14) Elimination of possible damage to cane trucks due to capsizes or runaways in the field.
- (15) Quicker turn-over of cane trucks with consequent reduction of number required by the mill transport department.
- (16) Ability to take cane right up to the mill cane carrier, thus releasing basket trucks and S.A.R. trucks for use in areas at greater distances from the mill.
- (17) Use of lorry or tractor for other work in the off-season.

Disadvantages of Road Transport

- (1) Immobility during wet weather.
- (2) Highly-paid labour required as drivers. This, however, is more than compensated for by advantages (8) and (10) above.
- (3) Higher standard of housing required for drivers.
- (4) Provision of suitable off-crop work for drivers.
- (5) Maintenance expenditure on lorries, tractors and trailers. This is offset to a considerable extent by advantage (9) above.

It appears, then, that the advantages of road transport over field tramline outnumber the disadvantages in no uncertain manner. In fact the only

serious disadvantage is that of immobility in wet weather and this varies tremendously according to the type of soil or road surface in any particular area. On a very sandy farm, for instance, road transport may be even easier under wet, than under dry conditions, while, on the other hand, over black or red soil farm roads lorries cannot operate at all until the roads dry out.

As to a comparison of costs between the two methods no definite statement can be made. Either method may prove the more economical depending on the conditions prevailing under which the transport is being carried out, which vary so considerable from place to place. Under general average conditions there is probably very little difference between the two methods in the final cost per ton. The decision to use field tramline or road transport must be made according to the conditions under which it is intended to operate. For instance if a farm already has adequate field tramline on hand, and permanent earthworks constructed over easy grades, it is more than likely that no change could be made for the better. On the other hand should new territory be opened up with no existing transport facilities it seems that road transport would be the more attractive proposition especially when it is borne in mind that the present cost of only one mile of 16 lb. track, complete with sleepers, etc., is £1,850.

The road transport method is itself divided into two systems, by use of lorries or by use of tractors and trailers, each system having advantages of its own. It is assumed that only Diesel driven lorries and tractors are under consideration owing to the very much higher running costs of petrol-driven vehicles, and further, that the load of cane from either lorry or trailer is transferred to the truck by a gantry or crane.

In order to compare the two systems of road transport the different advantages and disadvantages are set out below.

Advantages of Diesel Lorry over Tractor and Trailer

- (1) Able to operate over longer distances owing to greater speed. Under normal working conditions a lorry carrying a double load, i.e. two truck loads, can do eight trips of 10 miles, and deliver 16 truck loads per day. In an emergency over 100 miles per day has been achieved.
- (2) Greater power. A diesel lorry of 120 b.h.p. will carry a load of 9 tons up a gradient where a tractor and trailer will fail with 4 tons.
- (3) Over double the amount of working hours can be expected from a lorry during its lifetime.
- (4) It is far easier to transport a dual load, i.e. two truck loads at a time, on a lorry. Although dual load trailers are in use they operate satisfactorily only under comparatively favourable conditions.
- (5) Half the number of drivers will be required, it being assumed that dual load lorries are being used, whereas in the majority of cases tractors haul a single load.

Disadvantages of Lorries

- (1) Capital outlay for a unit far greater. Although it may be noted that the outlay for one dual load capacity lorry is practically the same as for two tractors and four trailers, which would be required to do the same amount of tonnage.
- (2) A lorry cannot be taken right up to the cutters in the field for loading to the same extent as a tractor and trailer.
- (3) Time taken for loading as against a tractor having a loaded trailer waiting. This is not considered a serious disadvantage as it is more than compensated for, except under very short haulages, by the extra speed of the lorry and by the saving of time in attaching a trailer.
- (4) Lorries cannot be used for cultivation when not required for transport.

The decision whether to use lorries or tractors and trailers depends, once again, on the particular conditions on which the transport is to operate. It appears that for the smaller planter whose crop can be handled by one tractor and two trailers, over short distances and easy grades, that this method would prove to be the better. On the other hand for the large crop over long distances and steep grades the Diesel lorry should be more satisfactory. For the bigger planters, whose crops warrant it, or for the miller-cum-planter estates, a combination of the two systems is to be recommended, when, according to prevailing conditions, either can be used to its best advantage.

The costing of the various methods has been deliberately omitted as it is felt that it is too much of a controversial nature to introduce into the few observations that have been made in this paper, the object of which is only to open up a discussion on field transport, which, it is hoped, will prove interesting and informative.

Mr. Grant said that he was glad to have the opportunity of being in the chair for the reading of this paper, as some growers had mentioned to him during Congress that they felt that most papers would be of too high a standard technically for them to fully understand or to take part in the discussion. This was probably one reason why attendance by growers has at times been poor. However this paper was on a subject to which many growers were giving thought at the present. It was such that any grower or person with no technical training could enter into the discussion, and was an example of many papers which have been presented at our Congresses. He thought that the knowledge that such papers were presented, might encourage more growers to attend.

Mr. Boa then made the following contribution to the discussion: In 1948, 1950 and this year, the Sugar Association has made surveys of cane production methods. From the results of these surveys it can be seen that tractors and trailers are replacing motor lorries and portable tramline for transporting cane. In 1948 46 per cent. of growers used motor lorries, 17 per cent. used tractors and trailers and 21 per cent. used portable tramline. Now, motor lorries have been reduced to about 30 per cent., tramline to 14 per cent., while tractors and trailers have increased to 44 per cent., and although a few growers intend to buy heavy motor lorries, many are changing to tractor and trailer, so that by 1956 it is likely that 50 per cent. of growers will use tractors and trailers and only 25 per cent. motor lorries.

This change of method tends to show that the advantages which Mr. Steward has set out in his paper for Diesel lorries can only operate in very limited circumstances. These circumstances may be a distance of over ten miles; only about $2\frac{1}{2}$ per cent. of growers carry their cane this distance.

Also, now that larger-wheel tractors are becoming more common, it is probably that trains of two or three trailers will become usual for longer road hauls of under ten miles. A 45 b.h.p. tractor should manage to transport ten to fifteen tons of cane on farm and main roads and about five to seven tons in field conditions, where the gradient does not exceed 1 in $3\frac{1}{2}$. If the trailer brakes are adequate, this type of outfit travelling at twelve to fifteen miles per hour, should be safe on the road and that alone does much to commend it.

Mr. Steward in reply to Mr. Boa's statement that one advantage which he gave in favour of the use of Diesel lorries was that they could operate only in very limited circumstances, he would point out that Mr. Boa's deductions had been arrived at from figures

submitted by planters in a general survey of transport methods. Now it may well be the case that the initial cost of a large Diesel lorry was the reason for the use of tractors and trailers figuring more prominently in the percentages quoted by him. He was of the opinion, however, that given the conditions as outlined in his paper, Diesel lorries could not be omitted from consideration when efficient, fast and economic road transport was required.

Mr. Boa mentioned, also, that with larger wheel tractors becoming more common, it was probable that trains of two or three trailers would become more usual. While appreciating the fact that a train of trailers may be the ideal at which to aim, he felt that the roads on practically all farms and estates are not of the standard required to allow of the operation of a train of trailers. He was sure that it had been the experience of most planters that operating only one trailer had often given them enough to worry about when contending with sand, mud, sharp corners, steep gradients and the like.

It was axiomatic that good roads are the complement of successful road transport, and that meant more attention would have to be given to them, and more money spent on them, than had been done in the past, until the time was reached when it would be a practicable proposition to operate a tractor with a train of trailers.

In reply to Mr. Park, Mr. Steward said that cane was loaded on to the lorry by hand, but usually unloaded by crane. The loading of lorries divided into compartments was much easier than the loading of cane trucks, for a boy could just dump his load into a box on the lorry, whereas in loading cane trucks, the cane had to be properly placed—a matter of some skill.

Mr. Park enquired about the matter of loading cane mechanically. He thought that mechanical loading would be cheaper.

Mr. Steward pointed out the difficulties of terrain in a large portion of the sugar lands in South Africa which did not lend itself to mechanical loading.

Mr. Palairat said that for a large crop, tractors and trailers would pay best. With a smaller crop and a long haul, Diesel lorries should be used, whereas on a small crop and short haul, a petrol lorry would be best. Until a considerable number of cost accounts were available, dividing lines could not be drawn and individual growers must still use their own judgement.

Mr. Renaud said he thought that it would be agreed that a bonus system for loading could be more easily applied on a tramline than where lorries or tractor and trailers were used.

Mr. Steward said that in all cases the method of calculating the bonus was the same, although in the case of loading lorries, the bonus had to be divided among a larger number of labourers, so it was possible that a boy not pulling his weight in a lorry gang would be paid more than he was entitled to as his share of the total bonus.

Mr. Renaud said that all our troubles revolved around labour and the smaller the number of boys the bonus had to be split amongst the more inducement there was for a boy to work harder.

Mr. Steward said that on a general average boys loading lorries could accomplish more and therefore earn more bonus than those loading trucks. Labourers preferred loading lorries or trailers to loading trucks, because of the short carry involved and also because they were not kept waiting for trucks.

Mr. Machin wanted further explanation as to why Mr. Steward considered the operation of lorries was cheaper than a tractor and trailers.

Mr. Steward replied that this was based on his own observation which showed that a lorry had a much longer life than a road-type tractor, so that depreciation on a lorry was less.

Mr. Machin said a lot of factors entered into it, but he thought that frequently too light a tractor was used for hauling, with the consequence of rapid wear. If a tractor of adequate size were used, there was no reason why the life of the tractor should not be just as long as that of a truck.

Mr. Turner enquired, when carrying heavy lorry or trailer loads, say nine tons, was any trouble caused to ratooning through compaction of the soil?

Mr. Steward replied that when running over the field a certain amount of damage was done to the roots and when using heavy Diesels it was inadvisable to take them right up to the cutters. The ideal method was to have roads laid out, so that all lorries or trailers could be loaded without leaving a road.