

AN EXPERIMENT IN CANE PLANTING USING DIFFERENT AMOUNTS OF SEED CANE PER ACRE

A great amount of discussion takes place amongst planters concerning the amount of cane which ought to be planted in order to obtain the best stand and most profitable returns.

The impression gained by discussing this question with many planters is that the majority of them plant "Double Stick," that is, plant two continuous lines of cane in the furrows. It is usually considered that this method of planting requires approximately 2½ tons of seed cane per acre, when the lines are between 4½ feet to 5 feet apart (the most usual spacing on ordinary hillside fields).

Other ways of planting cane are "Single Stick" —one continuous line of cane in the furrow, and what is somewhat loosely called "Stick and a half," which means that the canes are laid in the lines overlapping each other so that the amount of seed cane used is more than that required for "Single Stick" planting in proportion to the overlap.

In other sugar countries the practice seems to be to use less seed cane than in this country.

At the South African Sugar Experiment Station, Uba cane has, as a rule, been planted "Single Stick," and in almost every case a good stand has been obtained, very few blanks having to be filled in. In view of these facts the question naturally presents itself as to whether the prevailing practice of planting "Double Stick" is justified by results. This experiment was arranged to endeavour to obtain a fair comparison of the results from different methods of planting.

Twelve plots were taken each 1/15th acre in extent. Four were planted "Double Stick," four "Single Stick," and four with half the amount of seed cane required for single stick spaced out as evenly as possible; the cane rows in each case were 5 foot apart. The cane used was weighed and averaged: "Double," 4,180 lbs.; "Single," 2,090 lbs., and spaced "1,045" lbs. per acre. The plots were all treated alike in every other way and no blanks were filled in. The plots were planted 1/11/27 and reaped 16th to 24th August, 1929.

Diagram of Plots Showing Yields Per Acre.

Spaced. Yield per acre. 21.64 tons.	Single. 25.85 tons.	Double. 31.22 tons.
Double. 28.93 tons.	Spaced. 23.23 tons.	Single. 28.31 tons.
Single. 27.05 tons.	Double. 25.73 tons.	Spaced. 23.62 tons.
Spaced. 25.50 tons.	Single. 29.60 tons.	Double. 32.07 tons.

The average yields were:—

	Standard Deviation from mean.	Standard Experimental Error.
Spaced, 23.5 tons per acre.	1.46	0.73
Single, 27.7 tons per acre.	1.40	0.70
Double, 29.5 tons per acre.	2.46	1.23

During growth the plots were under constant observation. It was noticed that the double planting came up thickest as was to be expected and closed in somewhat sooner than the single planting, but at no stage was it noticeably taller. There were very few blanks in either the Double or Single-planted plots, but it is considered that had the few blanks that did appear in the Single-planted cane been filled in the yields of the plant cane crop would have been even closer than was the case. As it was it cannot be said that the extra average yield from the Double over the Single planting of 1.8 tons per acre paid for the extra 1.1 tons of seed cane used at planting plus the labour involved in planting it. In any case the average difference between the Single and Double planting results is less than three times the calculated experimental error, so that the difference cannot be regarded as significant.

In the case of the spaced plots there were quite a number of blanks, and these, undoubtedly, were largely responsible for their reduced yield. The spaced plots also took decidedly longer to close in, and during the first growing season the cane on them was not quite so tall as on the other plots. However, in the second growing season there was no noticeable difference in height.

Chemical analyses of hand mill samples were carried out of each plot of cane, the average results being as follows:—

	Sucrose per cent. Cane.	Purity.	Fibre per cent. Cane.	Reducing Sugar Ratio.
" Spaced "	13.94	88.4	13.5	2.69
" Single "	13.68	87.9	13.3	3.18
" Double "	13.90	89.8	13.6	2.80

No definite conclusions may be drawn from these.

This experiment will be carried on to the ratoon crops. At present the stools of cane appear somewhat more vigorous on the Spaced and Single-planted plots than they do on the Double-planted ones, so it is possible that fields that have been Single-planted may ratoon better than those that have been Double-planted. The Spaced plots are not likely to catch up to the others in yield, because of the considerable number of blanks in them, even if the individual stools are very good.

Conclusion.—The general conclusion on the plant cane results are that there is no apparent advantage of "Double Stick" planting over "Single Stick," under the conditions of this experiment, but that both are slightly better than planting with a space between each two setts equivalent to the average length of a sett.

Experiment Station,
South African Sugar Association,
Mount Edgecombe, Natal.

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Mr. MOBERLY: I think we can congratulate Mr. Dodds and the whole staff of the Experiment Station upon carrying out tests which go far towards supplying an answer to a long standing question. The results can hardly be considered as final, as it would be necessary to know the results from the first ratoons before any conclusive results can be obtained from them. I do not know whether any questions occurred to anyone here arising out of this paper, but perhaps you have some questions to ask Mr. Dodds, and perhaps the planters present would like to ask a few questions.

Mr. PALAIRET: With regard to single and double stick planting, there is so very little difference between the two results that the difference in my opinion is very much more than compensated for by the extra labour involved at a time when everything is done at a rush, and every acre counts, and every single man on the farm is of importance. So the probability is that single planting is better, but there is more than that, there are the ratoon crops to be considered. I do not want to compare our rough field work with proper experiments such as these, but I would like to mention that I tried spaced planting in one field, which was in really

excellent tilth, and I expected a very late crop, but I did not get it. In comparison with other fields it came away well, and gave a yield fully comparable with the other cane. The first ratoons are now ready for cutting and by the look of them they are about the best on the farm. This is from spaced planting. One question before closing: Why do we need to plough out our ratoons? The real reason seems to be that the cane has overcrowded itself. That is rather indicated by the fact that those planters who plough very close to the roots in their ratoon ploughing really prune the roots and generally get longer ratoons. That is rather a point in favour of single cane planting as against double. If your plant crop is comparable, the probability is that single stick planting will show advantages in the ratoons, and in that respect I am interested in seeing a comparison between the ratoons. Yet if that advantage appears, spaced planting should show it very much more strongly. When I did my second spaced planting the field was not too well prepared. There were a few misses and it was very late in forming a cover. The present indications are that spaced planting in a field in poor tilth does not pay, so really when you come to think of it the amount of cane you use in planting should probably be judged carefully for each individual field. You should study your tilth and your type of soil and the rainfall conditions, the month of planting, and things of that sort. There is very little likelihood of our being able to get any definite standard method, but where you have good tilth and good moisture conditions, spaced planting should prove the best.

CHAIRMAN: I would like to point out that the conditions of these experiments were rather to the disadvantage of the spaced planting. In the first place we did not fill in any of the misses, as one naturally would in ordinary practice, and furthermore the cane was planted in some of the poorest soil at the Experiment Station, and had a very difficult time in November 1927, when, as you recollect, it was a very dry season and recorded as one of the driest years on record. All that was to the disadvantage of the free germination of cane planted under such conditions. It remains to be seen what we shall get from the ratoons.

Mr. PALAIRET: I hope Mr. Dodds will consider repeating the experiments if at any time an opportunity offers under varying conditions.

CHAIRMAN: I would like to do this very much on different types of soil in co-operation with planters if it can be arranged.

There being no further comments, the Conference passed on to Paper No. 13a: "An Experiment in Green Manuring for Sugar Cane, which was read by Mr. Dodds.