

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

Part 2.—RESULTS FROM THE FIRST RATOON CROP.

By H. H. DODDS and P. FOWLIE.

The following paper was read by Mr. FOWLIE :—

In these Proceedings of 1930, page 117, we published a report of this experiment dealing with the results obtained from the plant cane crop.

The first ratoon crop was harvested in July, 1931 and, and the purpose of this report is essentially to give the information thus obtained, but before doing so it is considered advisable to repeat the main scheme of the experiment and the results previously given from the plant cane crop. This is necessary to make the latest results clear as well as to put forward all the data obtained from this experiment to date.

This experiment was planted on 1st November, 1927. There are twelve plots each $\frac{1}{15}$ th acre in extent. Four were planted "Double Stick," that is two continuous lines of cane in the furrow. Four were planted "Single Stick," spaced as evenly as possible. The cane used was weighed, and averaged, "Double" 4,180 lbs.; "Single," 2,090 lbs. and "Spaced," 1,045 lbs. per acre. The lines were all five feet apart, and were all fertilized and cultivated alike. The cane germinated well, and blanks were not numerous. The spaced planting naturally suffered most in this respect. None of the blanks were filled in.

The plant cane crop was reaped 16th to 24th August, 1929, and the results were as follows :—

Diagram of Plots Showing Yields per Acre.—Plant Cane Crop.

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

Average yields were :—

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

After the plant cane crop had been cut, the plots all received the same treatment during the growth of the first ratoon crop. This was cut on 2nd to 6th July, 1931, and the results were as follows :—

Diagram of Plots Showing Yields per Acre—First Ratoon Crop.

Spaced Yield per Acre 27.26 tons	Single 25.50 tons	Double 22.46 tons
Double 27.71 tons	Spaced 22.20 tons	Single 22.88 tons
Single 22.72 tons	Double 25.98 tons	Spaced 23.77 tons
Spaced 21.45 tons	Single 31.87 tons	Double 27.00 tons

The average yields were :—

	Standard Deviation from mean	Standard Experimental Error
Spaced, 23.67 tons per acre	3.24	1.12
Single, 25.74 " " "	3.71	1.86
Double, 25.79 " " "	2.02	1.01

These figures show that single and double planting gave almost exactly the same yields at the first ratoon cutting and that spaced planting was not so far behind as it had been in the plant cane crop.

The lesson of this experiment appears to be that it does not make much difference to the yield how much cane is planted, provided a good stand is obtained.

Blanks in a field, of course, reduce the yield but if there are no blanks, cane can thicken out from single planting to be as good as from double planting. On the other hand, no harm is done by planting more seed cane than is actually necessary.

The practical question appears to resolve itself into one of cost and expediency.

When planting under favourable growing conditions with plant material of good quality, single planting gives good results and the extra cost of planting double is not warranted, but when conditions are less favourable, it may sometimes be wise to plant stick and a half or even double stick as some extra insurance that a good stand will be obtained without replanting.

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Mr. FOWLIE continued: In addition to what we have written in the paper, I would like to add a few remarks on the experience we have had in planting new varieties of cane, where we have used little plant material simply because we wanted to make the material go as far as possible. Our experience in that connection bears out what I have said in this paper, that it does not really matter how many "eyes" or how much plant material is used for planting, provided enough is used to get a stand. If you can space, say, P.O.J.2725 cane two and a half feet apart with a single "eye" in each hole and these eyes grow, by the time this cane is six or nine months old the stools are just as good as if you had put in a continuous line of cane. If you get blanks, they require to be filled in afterwards, and, as Planters know, filled-in cane never does so well as that put in at the time of planting.

Mr. ASKEW: What distance was the space between the two pieces of cane in your space planting?

Mr. FOWLIE: What we did was to use half the amount of cane used for single planting. What we actually did in the lines when planting that experiment was to put in the cane in the ordinary way, end to end in one line, and then when we had planted that line we took out half and put it into the next line. We afterwards cut them up to make the spaces as even as possible. The actual space would depend on the actual size of the cane cut.

Mr. ASKEW: In all the years I have been planting we have put down a double line, and we have often wondered whether we were not wasting seed. I was talking to a planter at Kulu one day, and he said, "I have been planting single cane; my neighbour across

the road plants likewise, he takes little pieces of cane about six inches, and he plants them across the lines, nine inches apart." I demurred at that, and he said, "Come along, I will show you the field." We went along and saw this field, and it was just as good as a field we had with a double line of cane lengthwise. He said he had always planted single line, but he was now going to plant 12-inch canes nine inches apart, something on the lines Mr. Fowlie has suggested. The thing I wanted to mention is this cross planting. It astonished me to see it.

Mr. BOOTH: We have heard a lot about costs this morning, and I think Mr. Askew was very much against Mr. Watson's proposition for costing. I wonder if Mr. Askew would tell us how much it costs to weed that field before it grows over, as compared with double planting. It would cost you a little bit more to produce a ton of cane on that field than otherwise.

Mr. ASKEW: We had a field planted a quarter of a mile away in the ordinary way, and I could not see any difference between the two. I am astonished at it, and cannot account for it. I am not going to adopt it, but there it is, the result is there to be seen.

Mr. BOOTH: With regard to the remarks about blanks and the yield of cane, does Mr. Dodds carry that as far as the second ratoons, so far as the yield per acre is concerned?

Mr. FOWLIE: It could be carried to the second ratoons.

Mr. ALF. WARNER: I would like to ask Mr. Fowlie if he cut those canes before placing them in the rows, or what effect it has if a long cane lies in the row and is covered without being cut. Does it grow first from the top, bottom, or centre? Which are the best parts of the cane to cut it, the top or middle of the stick. In some countries they take all top cane and plant it at an angle of 45 degrees—they do not cover them up, like we do. A great deal of the misses in single and double planting is due to the class of cane selected. As a rule they just cut down a field, take a bundle of cane, throw it in and cut it. Some of it is dead and rotten before it is even covered up. In my opinion, if the canes were selected and every stick examined before put in, single planting is quite as good as double. But I should like to know if the setts Mr. Fowlie speaks of were cut, and if not cut, what effect it has; would it sprout from the top or centre or the bottom first?

Mr. FOWLIE: This opens up the whole question of what is good plant cane. Now I think there is not much doubt about it that good plant cane ought to be cane under one year old. If we are asked what ought to be used for planting, we generally say take young cane, either plant cane or first ratoon cane, if possible, but certainly cane that is not more than approximately one year old; in other words, when planting do not take old cane that is ready for the mill, but take one-year-old cane and use that for plant material. If that is taken, and it has a sound appearance and sound top,

I think one is reasonably safe in taking it and placing it in the lines without selecting it any other way—that is, without stripping it and looking at the nodes—and if you plant a single line you will get a reasonably good stand, growing conditions being suitable and everything else. As to cutting in the lines, if long cane is placed in the lines, I recommend cutting it by hacking with a cane knife into about 12-inch pieces. Some people would say 18 inches, and some 6 inches, but I do not think there is any definite length that is absolutely necessary. I think 12-inch pieces are suitable. Undoubtedly, if the cane is stripped and examined and cut into lengths before being put into the furrow, it is an extra insurance against planting cane that will not grow; but as it is a matter of cost again, this method of stripping and cutting up comes out a little bit more expensive in labour, and unless you are going to save cane in the process it is perhaps not worth it, provided you can reasonably trust the plant cane you are putting in, and cut it up in the furrows. At the Experiment Station, when we are planting for fertiliser experiments or for propagating cane of Uba or any of the varieties similar to Uba, we simply plant the long canes in the furrow, approximately end to end, what is known as single stick planting, chop them up after they are in and cover them up; and we have found that unless some particularly unfavourable growing weather intervenes or something out of the ordinary occurs, that single stick planting will give us a suitable stand, with practically no filling in of blanks. This season, with unfavourable weather, there was a certain amount of filling in of blanks in odd places, besides this experiment I have mentioned; but last season, when we planted quite a considerable amount of cane under better conditions, I do not think we did any filling in. All the cane was planted single stick and looks well. Just to show what is possible in the way of thinning down the amount of plant cane, I will trespass on one of the papers we are going to have tomorrow, and refer to an experiment to test the effect of streak on cane. That experiment was planted with exactly the same number of “eyes” of cane on each plot, the idea being to be able to compare the plants from a given number of “eyes” on each plot. We planted these in holes four feet apart each way. We originally planted three seed pieces, each with one “eye,” in each hole; but the intention was to thin these down to one “eye” per hole, and that was done as soon as the plants were big enough so that we could distinguish how many healthy plants there were, and we left one healthy plant in each hole. If any of the holes missed, we transplanted plants from others carefully. That meant we had one “eye” to produce each stool of cane,

and each stool of cane covered an area of four feet by four feet, or sixteen square feet in all. When we cut the plant cane on that experiment we got over 40 tons to the acre.

Mr. BECHARD: In certain years—probably this year is going to be one of them—you get white ends in the cane. This cane is useless from the milling point of view. Unfortunately, we get quite a lot of it. It damages the work at the mill and also prejudices the planter in this way, that it runs down his purity and his sucrose. The point I want to make is, would it be advisable to keep these tops for planting, because in certain years you will have plenty of this material.

Mr. FOWLIE: Am I to understand that the white ends you refer to are tops that have more or less dried out?

Mr. BECHARD: Tops that are growing very quickly during the winter; growing cane which has not time to mature.

Mr. FOWLIE: If you have quick growing tops on two-year-old cane, these tops would be quite suitable plant material, provided you want it at the time you are cutting the cane. I would not recommend keeping them over or doing anything to preserve them for planting for any length of time, although I believe that is done in some cases. If you could get these quick growing tops cut and used for planting within a reasonably short time after cutting it, probably it would be a good plan to use them for planting.

CHAIRMAN: The last few questions we have had indicate a possible line of investigation which I hope the Experiment Station will carry on in future years, that is, to try the results of different kinds of seed material. I think very useful information could be got that way, just as useful information has been given already on the question of single, double or spaced planting. This is another useful bit of work by the Experiment Station, who have done so much to give us interesting matter this year. (Applause.)



The next paper on the agenda, having already been referred to during previous discussion, was not read in its entirety, as it was more for purpose of record. Mr. Fowlie, however, dealt with the latter portion of the paper, as will be seen from his remarks set out below. The paper is as follows:—