THIRD PROGRESS REPORT ON EXPERIMENTS AT UMFOLOZI SUB-STATION

THE STAFF OF THE S.A.S.A. EXPERIMENT STATION.

This report summarises the results obtained at Umfolosi sub-station from the crop harvested from experiment plots during the 1936-37 milling Season. The various experiments were described in previous reports presented to this Association last year and the year before and these ought to be referred to for fuller details than can be repeated in this paper. Ten tables are given in the same form as last year except that the figpres for corrected Sucrose have been dropped because the bonuses and penalties for high and low purities were stopped when the new Agreement came into force in 1936.

Results of Experiment.

Experiments Nos. 1 and 2 compare the same seven varieties. The results from both are given below.

UMFOLOZI EXPERIMENT No. 1.—VARIETY TRIAL. THIRD RATOON CROP.
Harvested at 13 months' old, November, 1936.

	P.O.J. 2725.	Co. 290.	P.O.J. 2878.	P.O.J. 2727.	P.O.J. 2714.	CH. 64/21.	UBA.
Tons cane per acre	46.90	54.85	43.23	44.63	19.40	37.69	35.81
Increase tons cane per acre over Uba	10.28	19.04	7.42	8.82	−16.41	1.88	—
Percentage tons cane per acre compared with Uba	128.7	153.2	120.7	124.6	54.2	105.2	100.0
Tons pol (sucrose) per acre	6.33	6.48	5.56	5.30	2.57	4.09	3.89
Increase tons pol per acre over Uba	2.44	2.59	1.67	1.41	−1.32	0.20	—
Percentage tons pol per acre compared with Uba	162.7	166.6	142.9	136.2	66.1	105.1	100.0
Pol (sucrose) % cane	13.74	11.81	12.87	11.88	13.27	10.84	10.86
Fibre % cane	8.68	10.63	9.52	9.91	10.15	10.25	9.67
Juice: Brix	18.1	16.2	16.9	16.2	17.3	14.5	14.1
Pol (sucrose) %	16.06	13.59	14.82	13.98	15.36	12.07	11.66
Purity	88.7	84.0	87.4	86.3	89.0	83.1	83.5
Reducing sugar ratio	1.16	1.89	1.99	1.43	1.23	2.72	2.85
Total value of sucrose per acre at £5.76923 per ton	£36/10/5	£37/7/8	£32/1/6	£30/11/6	£14/16/6	£23/11/11	£22/8/10
Value of gain or loss compared with Uba for this crop	£14/1/7	£14/18/10	£9/12/8	£8/2/8	−£7/12/4	£1/3/1	—
General mean = 5.275 tons sucrose per acre.							
Percentage of general mean	120.0	122.8	105.4	100.5	48.7	77.5	73.7

Significant error of difference between varieties at 19 : 1 odds = 0.852 tons sucrose per acre.
Percentage significant error of difference between varieties at 19 : 1 odds = 16.2 %.
Value of significant difference between varieties per acre at 19 : 1 odds = £4 18s. 4d.

Gain or loss compared with Uba.

	P.O.J. 2725.	Co. 290.	P.O.J. 2878.	P.O.J. 2727.	P.O.J. 2714.	CH. 64/21.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Frist ratoon, harvested at 18 months' old, Aug.-Sept., 1934	43 3 3	35 4 7	31 4 9	18 3 5	20 2 8	−5 6 3
Second ratoon, harvested at 14 months' old, October, 1935	18 9 7	18 4 0	9 12 1	6 7 11	−5 3 11	−0 8 11
Third ratoon	14 1 7	14 18 10	9 12 8	8 2 8	−7 12 4	1 3 1
Total gain or loss compared with Uba over three crops	75 14 5	68 7 5	50 9 6	33 4 0	7 6 5	−4 12 1

UMFOLOZI EXPERIMENT No. 2.—VARIETY TRIAL. SECOND RATOON CROP.

Harvested at 13 months' old, 10th to 26th November, 1936.

	P.O.J. 2725.	Co. 290.	P.O.J. 2878.	P.O.J. 2727.	P.O.J. 2714.	CH. 64/21.	UBA.
Tons cane per acre	38.54	45.42	35.26	39.03	27.77	38.66	34.12
Increase tons cane per acre over Uba	4.42	11.30	1.14	4.91	—6.35	4.54	—
Percentage tons cane per acre compared with Uba	113.0	133.1	103.3	114.4	81.4	113.3	100.0
Tons pol (sucrose) per acre	5.80	5.86	4.97	5.49	4.30	4.49	3.84
Increase tons pol per acre over Uba	19.6	2.02	1.13	1.65	0.46	0.65	—
Percentage tons pol per acre compared with Uba	151.0	152.6	129.4	143.0	112.0	116.9	100.0
Pol (sucrose) % cane	15.04	12.89	14.10	14.06	15.49	11.61	11.26
Fibre % cane	10.43	10.66	11.01	10.58	10.38	11.05	12.10
Juice: Brix	19.7	17.5	18.6	18.6	20.4	15.5	16.1
Pol (sucrose) %	18.14	15.35	16.83	16.68	18.78	13.52	14.06
Purity	92.2	88.0	90.5	89.7	92.3	87.0	87.4
Reducing sugar ratio	0.44	0.79	1.01	1.17	0.60	1.08	1.15
Total value of sucrose per acre at £5.76923 per ton	£33/9/3	£33/16/2	£28/13/6	£31/13/6	£24/16/2	£25/18/1	£22/3/1
Value of gain or loss compared with Uba for this crop	£11/6/2	£11/13/1	£6/10/5	£9/10/5	£2/13/1	£3/15/-	—

General mean = 4.963 tons sucrose per acre.

Percentage of general mean	116.9	117.9	100.1	110.6	86.6	90.5	77.4

Significant error of difference between varieties at 19 : 1 odds = 0.580 tons sucrose per acre.
Percentage significant error of difference between varieties at 19 : 1 odds =11.7 %.
Value of significant difference between varieties per acre at 19 : 1 odds = £3 7s. 0d.

Gain or loss compared with Uba.

	P.O.J. 2725.	Co. 290.	P.O.J. 2878.	P.O.J. 2727.	P.O.J. 2714.	CH. 64/21.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Plant cane, harvested at 21 months' old, August, 1934	38 15 10	27 11 6	27 11 6	20 1 5	7 15 5	1 4 2
First ratoon, harvested at 14 months' old, October, 1935	15 19 11	14 18 9	7 8 11	8 18 4	—1 14 0	2 15 2
Second ratoon	11 6 2	11 13 1	6 10 5	9 10 5	2 13 1	3 15 0
Total gain or loss compared with Uba over three crops	66 1 11	54 3 4	41 10 10	38 10 2	8 14 6	7 14 4

These two experiments have now each been harvested as experiments three times. The plant cane crop from No. 1 having been taken for planting when immature. The results from the third harvesting generally confirm those of the first and second harvestings and the indications still are that the first four varieties are P.O.J. 2725, Co.290, P.O.J. 2878 and P.O.J.2727 in that order. P.O.J.2725 gave a higher yield of Sucrose per acre than Co.290, in the 1st harvestings of both experiments but there was very little difference between the yields of Sucrose from these two varieties in the 2nd. and 3rd. harvestings.

This may either indicate that Co.290 is a better ratooner than P.O.J.2725 at Umfolosi or that P.O.J. 2725 does better than Co.290 when both are allowed to grow most of two growing seasons and that the reverse is the case when the cane is harvested at a little over one year, equalling practically only one growing season.

P.O.J.2725 has an advantage over Co.290 in that its average sucrose % cane is higher. An average of 69 comparative tests of these two varieties made at Umfolosi gave 13.00% for Co.290 and 14.46% for P.O.J.2725. Taken over the three crops there is no significant difference between P.O.J.2878 and P.O.J.2727. P.O.J.2878 was better than P.O.J.2727 at the first harvesting as plant cane but there was very little difference between them in the later harvestings. They were both significantly worse than the first two varieties when taken over three crops and significantly better than the remaining varieties. Of these C.H.64/21 seems very nearly the same as Uba, P.O.J.2714 is capable of giving a good crop of high quality plant cane but fails to ratoon satisfactorily. In some of the later crops it was actually poorer than Uba. It may now be definitely discarded as unsuitable for Umfolosi conditions.

The first ratoon crops of three experiments in which P.O.J.2725, P.O.J.2878, Co.290, Co.281 and Uba were compared, were harvested and the results are given below.

UMFOLOZI EXPERIMENT No. 7A.—VARIETY TRIAL. FIRST RATOON CROP.

Harvested at 15 months' old, 27th October, 1936.

	P.O.J. 2725.	Co. 281.	Co. 290.	P.O.J. 2878.	UBA.
Tons cane per acre	56.43	56.30	56.03	47.43	43.11
Increase tons cane per acre over Uba	13.32	13.19	12.92	4.32	—
Percentage tons cane per acre compared with Uba	130.9	130.6	130.0	110.0	100.0
Tons pol (sucrose) per acre	8.22	7.51	7.19	6.73	4.88
Increase tons pol per acre over Uba	3.34	2.63	2.31	1.85	—
Percentage tons pol per acre compared with Uba	168.4	153.9	147.3	137.9	100.0
Pol (sucrose) % cane	14.57	13.34	12.83	14.18	11.33
Fibre % cane	10.08	14.06	12.16	11.16	12.71
Juice: Brix	18.9	18.7	17.9	18.6	15.9
Pol (sucrose) %	17.11	16.63	15.67	16.85	13.49
Purity	90.8	89.0	87.7	90.5	84.7
Reducing sugar ratio	0.65	0.75	0.77	0.53	1.23
Total value of sucrose per acre at £5.76923 per ton	£47/8/6	£43/6/6	£41/9/7	£38/16/6	£28/3/1
Value of gain or loss compared with Uba for this crop	£19/5/5	£15/3/5	£13/6/6	£10/13/5	—
Percentage of general mean	119.0	108.7	104.1	97.5	90.7

General mean = 6.900 tons sucrose per acre.

Significant error of difference between varieties at 19 : 1 odds = 0.584 tons sucrose per acre.

Percentage significant error of difference between varieties at 19 : 1 odds = 8.5 %.

Value of significant difference between varieties per acre at 19 : 1 odds = £3 7s. 5d.

Gain or loss compared with Uba.

	P.O.J. 2725.	Co. 281.	Co. 290.	P.O.J. 2878.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Plant cane, harvested at 19 months' old, July, 1935	28 12 9	16 16 6	21 1 1	16 11 0
First ratoon	19 5 5	15 3 5	13 6 6	10 13 5
Total gain or loss compared with Uba over two crops	£47 18 2	31 19 11	34 7 7	27 4 5

UMFOLOZI EXPERIMENT No. 7B.—VARIETY TRIAL. FIRST RATOON CROP.

Harvested at 15 months' old, 30th October, 1936.

	P.O.J. 2725.	Co. 281.	Co. 290.	P.O.J. 2878.	UBA.
Tons cane per acre	58.87	58.83	55.87	49.11	45.46
Increase tons cane per acre over Uba	13.41	13.37	10.41	3.65	—
Percentage tons cane per acre compared with Uba	129.5	129.4	122.9	108.0	100.0
Tons pol (sucrose) per acre	8.18	7.67	7.13	6.61	4.98
Increase tons pol per acre over Uba	3.20	2.69	2.15	1.63	—
Percentage tons pol per acre compared with Uba	164.3	154.0	143.2	132.7	100.0
Pol (sucrose) % cane	13.90	13.04	12.77	13.46	10.96
Fibre % cane	10.50	13.36	11.90	12.19	11.56
Juice: Brix	18.4	18.1	17.8	17.9	15.4
Pol (sucrose) %	16.57	16.03	15.64	16.11	12.95
Purity	90.1	88.8	87.8	89.7	84.3
Reducing sugar ratio	0.63	0.96	0.84	1.05	2.52
Total value of sucrose per acre at £5.76923 per ton	£47/3/10	£44/5/-	£41/2/8	£38/2/8	£28/14/7
Value of gain or loss compared with Uba for this crop	£18/9/3	£15/10/5	£12/8/1	£9/8/1	—
General mean = 6.914 tons sucrose per acre.					
Percentage of general mean	118.3	110.9	103.1	95.6	72.0

Significant error of difference between varieties at 19 : 1 odds = 0.645 tons sucrose per acre.
Percentage significant error of difference between varieties at 19 : 1 odds = 9.3 %.
Value of significant difference between varieties per acre at 19 : 1 odds = £3 14s. 5d.

Gain or loss compared with Uba.

	P.O.J. 2725.	Co. 281.	Co. 290.	P.O.J. 2878.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Plant cane, harvested at 19 months' old, July, 1935	23 5 2	17 1 1	15 16 3	14 17 9
First ratoon	18 9 3	15 10 5	12 8 1	9 8 1
Total gain or loss compared with Uba over two crops	£41 14 5	32 11 6	28 4 4	24 5 10

UMFOLOZI EXPERIMENT No. 8.—VARIETY TRIAL. FIRST RATOON CROP.

Harvested at 15 months' old, 25th October, 1936.

	P.O.J. 2725.	Co. 281.	Co. 290.	P.O.J. 2878.	UBA.
Tons cane per acre	38.45	47.81	48.34	34.15	34.87
Increase tons cane per acre over Uba	3.58	12.94	13.47	—0.72	—
Percentage tons cane per acre compared with Uba	110.3	137.1	138.6	97.9	100.0
Tons pol (sucrose) per acre	5.94	6.59	6.82	5.03	4.74
Increase tons pol per acre over Uba	1.20	1.85	2.08	0.29	—
Percentage tons pol per acre compared with Uba	125.3	139.0	143.9	106.1	100.0
Pol (sucrose) % cane	15.45	13.78	14.11	14.73	13.58
Fibre % cane	13.26	16.00	13.07	13.38	14.88

Umfolozi Experiment No. 8—continued.	P.O.J. 2725.	Co. 281.	Co. 290.	P.O.J. 2878.	UBA.
Juice: Brix	21.5	20.0	19.6	20.3	19.5
Pol (sucrose) %	19.82	17.95	17.18	18.59	17.57
Purity	92.3	89.6	87.5	91.9	90.1
Reducing sugar ratio	0.56	0.65	0.76	0.71	0.57
Total value of sucrose per acre at £5.76923 per ton	£34/5/5	£38/0/5	£39/6/11	£29/0/5	£27/6/11
Value of gain or loss compared with Uba for this crop	£6/18/6	£10/13/6	£12/-/-	£1/13/6	—
General mean = 5.824 tons sucrose per acre.					
Percentage of general mean	102.0	113.2	117.1	86.4	81.4

Significant error of difference between varieties at 19 : 1 odds = 0.622 tons sucrose per acre.
Percentage significant error of difference between varieties at 19 : 1 odds = 10.7 %.
Value of significant difference between varieties per acre at 19 : 1 odds = £3 11s. 9d.

Gain or loss compared with Uba.

	P.O.J. 2725.	Co. 281.	Co. 290.	P.O.J. 2878.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Plant cane, harvested at 19 months' old, July, 1935	19 6 3	22 5 3	16 10 1	7 7 2
First ratoon	6 18 6	10 13 6	12 0 0	1 13 6
Total gain or loss compared with Uba over two crops	£26 4 9	32 18 9	28 10 1	9 0 8

These three experiments may be taken as replicates and discussed together bearing in mind that Nos. 7a and 7b are fairly near the river and on a somewhat higher level than No. 8, which is on a darker coloured soil further away from the river.

The soil and situation of No. 8 is probably typical of a larger area of the Umfolosi flats than Nos. 7a and 7b. In both plant cane and 1st ratoon crops Nos. 7a and 7b. gave heavier yields than No. 8 and the difference in favour of the former was greater in the 1st ratoons than in the plant cane. This is probably due to portions of No. 8 area being under water sometimes.

A good many stools of P.O.J. 2878 were blown over by the wind before the plant cane crop was harvested. This damage was greater in No. 8 than in Nos. 7a and 7b. The plant cane crop yield was not much affected by this because most of the fallen cane was fit to harvest but it affected the ratooning and reduced the 1st ratoon crop visibly.

Position of Varieties.

P.O.J.2725 again comes out as the best variety in these trials. In Nos. 7a and 7b it is significantly better than all the others both in the plant crop and the 1st ratoon crop. In No. 8 Co.281 gave a higher yield than P.O.J.2725 in both crops but the difference was not great enough to be significant at 19:1 odds.

Co.290 and Co.281 run each other very close in both harvestings of all three trials. The difference between them is not significant at 19:1 odds, but it is interesting to note that Co.281 came above Co.290 five times out of six and that the increased value of sucrose per acre per crop for Co.281 over Co.290 was £1 2s. 3d. calculated at last seasons price of sucrose.

AVERAGE YIELDS OF VARIETIES in Experiments Nos. 7A, 7B and 8.—Being the average yield from 18 plots over two cuttings = 36 determinations of each variety.

	P.O.J. 2725.	Co. 281.	Co. 290.	P.O.J. 2878.	UBA.
Tons cane per acre	62.11	63.02	61.89	51.41	44.75
Tons sucrose per acre	9.008	8.505	8.312	7.233	5.287
Sucrose % cane	14.504	13.496	13.431	14.070	11.815
Purity	91.3	89.6	85.8	90.6	86.8
Fibre % cane	10.37	13.44	11.48	11.17	12.27
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Value per acre per crop at £5.76923 per ton of sucrose	51 19 5	49 1 4	47 19 1	41 14 7	30 10 0
Value of cane per ton*	0 16 9	0 15 7	0 15 6	0 16 3	0 13 8

* Based on the past season's prices for a centrally-situated estate harvesting 6,000 to 7,000 tons of cane.

UMFOLOZI EXPERIMENT No. 6.—SPACING OF LINES. P.O.J. 2878 and P.O.J. 2725.

First Ratoon Crop, harvested at 26 months' old, October, 1936.

	P. O. J. 2878.				P. O. J. 2725.			
	4 ft.	5 ft.	6 ft.	7 ft.	4 ft.	5 ft.	6 ft.	7 ft.
Tons cane per acre	62.88	63.57	62.49	64.69	72.01	68.19	69.74	73.35
Tons pol (sucrose) per acre ..	9.93	9.89	9.29	9.86	11.16	10.43	10.53	11.38
Pol (sucrose) % cane	15.79	15.56	14.87	15.24	15.50	15.30	15.09	15.52
Fibre % cane	12.49	12.58	12.78	12.67	12.59	12.99	12.81	12.83
Juice: Brix	21.4	21.5	20.3	21.0	21.5	21.0	21.3	21.0
Pol (sucrose) %	19.41	19.26	18.21	19.00	19.50	19.03	18.79	18.98
Purity	90.8	90.3	89.9	90.4	90.8	90.7	88.1	90.3
Reducing sugar ratio	0.83	0.91	1.33	0.76	0.83	0.88	0.79	1.00
Total value of sucrose per acre at	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
£5.76923 per ton	57 5 9	57 1 2	53 11 11	56 17 8	64 7 8	60 3 6	60 15 0	65 13 1
Total value of plant cane crop ..	44 10 8	39 17 8	39 2 4	40 6 5	46 12 3	48 7 3	44 7 4	42 5 9
Total value of two crops	101 16 5	96 18 10	92 14 3	97 4 1	110 19 11	108 10 9	105 2 4	107 18 10

The above table shows the yields obtained from the 1st ratoon crop of the line spacing experiment No. 6. The results from the plant cane crop were given in the first report on the Umfolosi experiments two years ago. They showed a small advantage for the closer spacings which has not been maintained in the 1st ratoons. Taking the two crops there is no advantage from any spacing over the others great enough to be significant..

The comparative yields from the two varieties confirm the results of the various variety trials with regard to the relative merit of these two varieties. The average yields of each were as follows.

	P.O.J.2878.		P.O.J.2725.	
	Plant cane.	First ratoons.	Plant cane.	First ratoons.
Tons cane per acre ..	51.86	63.41	57.61	70.82
Tons sucrose per acre	7.49	9.74	8.30	10.87

In previous reports the yields from Fertilizer experiments Nos. 3, 4, 5, and 9, were given. These experiments all had dressings of fertilizer at planting time but no further application to the ratoons.

None of the various types of fertilizer used gave any significant increase over the yields of the unfertilized plots either in the plant crop or 1st ratoon crop. The 2nd ratoon crop was weighed and tested in 1936 but again the results were negative and it is felt that no good purpose would be served by quoting the results in detail in this report.

South African Sugar Association,
Experiment Station,
Mount Edgecombe,
February, 1937.

Mr. BECHARD: I am sure we are all indebted considerably to Mr. Fowlie in particular, and to all the members of the Experimental Station, especially of the field staff, for the very painstaking work they have done for many years. The experiments described here have been carried on over years, and they show fully the need for keeping one point in mind and carrying it on for a long period of time. Further, those experiments show a revolution has taken place in the production of the cane crop. I bear in mind, Mr. President, the remark you made in your Presidential Address, at the Opening of this Congress, when you said that 65% of the cost of production was planting costs. as against 35% milling costs. It is very interesting indeed when you read these experiments and you see that the return on the new varities over and above that of Uba varies anything from 40 to 65%. That will probably show where a reduction of costs can be obtained. There is certainly far more room for reducing costs in this department than there is in the milling department, and it is quite obvious that such spectacular results cannot yet be contemplated in the milling part of the Industry. I

want to congratulate Mr. Fowlie and his assistants and co-workers on a very excellent piece of work indeed.

Mr. MOBERLY: Mr. Chairman, I have been very interested in seeing these figures which Mr. Fowlie has given on the variety trials, especially in connection with the comparative sucrose per cent. cane, because during this year we have had practical experience of the crushing of these varieties, and unfortunately I have not had an opportunity of working out the results obtained at the mills in terms of mathematical significance, but when it is borne in mind that the averages we have obtained are averages of tens of thousands of tests, it will be seen that the significance of them is probably very marked. I did not expect to come down here this morning, and I have got no figures with me, but we find that almost invariably at every mill in every week, Uba showed the lowest sucrose per cent. cane. But Illovo was, I think, the only mill, at any rate where the cane testing service operates, where any of the released varieties showed a lower sucrose than Uba. P.O.J. invariably showed a very marked improvement and Co. 290 was intermediate With this comparison, you have got to bear in mind that we have, during the past season, used a higher Java ratio for Co. 290, and still higher for P.O.J. It is arguable whether that increase is justifiable; I am not prepared to give an opinion on it at the moment. I re-worked the figures on the basis of a common Java ratio of four varieties, and I found that the difference still persisted. The point to bear in mind, of course, in this is that the varieties were not crushed in equal proportions all through the season and in all districts. It sometimes happened that part of one variety would come from one area where cane was good and another week another variety would come from another area where it was bad, which would have the effect of a general average for any one week. With the exception of Illovo, we always found an advantage to the new variety canes over Uba, especially in Co. 290 and P.O.J. Co. 281 was rather more difficult to estimate, because the supply of it was very irregular, and I would not like to make any statement on it.

Mr. DODDS: There is very little in these papers that I feel calls for any further comment from me. They are examples, you no doubt understand, of the team work which is still necessary at the Experiment Station. The calculations and comments are mostly due to Mr. Fowlie and Mr. Colepeper, and the actual supervision of the field operations to Mr. Fowlie, Mr. Colepeper and Mr. Almond, with the help of Mr. Kirkwood and Mr. Chelin in the large number of cane tests that had to be done.

In the variety trial at the Experiment Station, Series G, the main point of interest here is that the only P.O.J. Cane that was tried, 234, was not able to compete under equal conditions with the best of the Co. varieties. It was generally the highest in sucrose content throughout, but did not compare in cane yield and ratooning qualities with the best of the Co. canes. This experiment proved a disappointment with regard to Co. 270, a cane which we had hopes a year or two ago would be worthy to compare with Co. 290 and 281, because of the excellent results it gave in the plant cane crop in this experiment, and in another experiment that was completed about the same time, but has not yet been recorded. However, in the ratoon experiments, Co. 270 has proved a disappointment, and we must therefore give up the idea of its release for the present.

Series H makes a rather important change in principle, to my mind, in so much that for the first time we abandoned Uba as a standard of comparison. It is so easy to find a cane that will surpass Uba in results that we decided a much higher standard was required at the Experiment Station, and any new varieties are compared with Co.281, which has proved the best of the varieties hitherto released. And you will see in Series H, one variety, 301, was able to surpass Co. 281, even under somewhat unfavourable soil conditions in this experiment. It will be very interesting to see further comparisons we have in different parts of the country between these two varieties.

Mr BIJOUX: Co. 301, in Series H, contains a very high reducing sugar ratio, 2.26. I think, both from the cultivating point of view and from the manufacturing point of view, it is interesting to find, with a cane of 93.1 purity, a reducing sugar ratio of 2.26. No doubt, when this variety is released, it will be a help in the manufacturing purity of molasses, at least.

Mr. MOBERLY: Apart from the actual comparisons of sucrose per cent. cane in these varieties at any one point, it is rather interesting to compare their figures throughout the crop, and one interesting point which came out on one season's working, only it remains to be seen how far it is borne out elsewhere, was that the peak of the season from the point of view of sucrose obtained was about the same date for all varieties. Actually it was one week later in the case of P.O.J., but that is hardly significant. In the early part of the season, our figures of mixed P.O.J. were not very reliable, but from about the middle of June, we were able to have more comparative figures. As you know, last year Uba cane started low and had a rather sharp rise up to a peak, which was the beginning of September, and then had a very sharp fall, which was accentuated by heavy rainfall in November, after which there was a bit of recovery, and then it fell down very sharply to the end of the season.

Co. 290 started off above Uba. (Position explained on blackboard). Those are the comparative seasonal effects. These effects during the rain are

interesting. as they appear to be dependent on the amount of trash on the cane. Uba, as we all know, carries a tremendous amount of trash, and naturally carries more water on it when crushed, and the effect on the sucrose during that period was very marked. There is less trash on Co. 290, and the effect was not so marked. On the P.O.J. varieties there was very little trash. There was water all that week, but it was only slight. With Co. 281, as I said, the results from week to week were difficult to compare, because there was not much of it, and it came sometimes from one area and sometimes from another, but the actual graph of it was something like this (explained on blackboard). P.O.J came more from Zululand than elsewhere, and Zululand sucrose was not good. At the beginning of the season, very small quantities were coming in—only about 5%—and it increased week by week till about August, when it got up to about 50% of the crop, that is mixed non-Uba varieties. From that point it was fairly level, and remained about 60% of the total deliveries. That was the average of 12 mills on which cane testing services are carried out. It does not represent the individual average.

A vote of thanks was passed by acclamation to Mr. Fowlie.