

FIELD TRIALS OF SUGAR CANE VARIETIES AT THE EXPERIMENT STATION.

By the AGRICULTURAL STAFF of the Experiment Station.

VARIETY TRIAL.—Series E.

At the Seventh Annual Conference of this Association, a paper was given entitled "A Field Trial of Some Sugar Cane Varieties—Series E." This described a variety trial at the Experiment Station comprising 12 varieties of sugar cane, including all the varieties that have since been released for general planting, except Co.301, which was not available for planting in 1930 when this experiment was laid down.

The first part of this report gives the results obtained from the first and second ratoon crops and reviews the results obtained over three crops.

It is not considered necessary to repeat what was said in the previous paper about the form of the experiment, nature of the soil, fertiliser treatment at planting, etc.

After the plant cane crop had been harvested the trash was lined into alternate rows, and the rows without trash were pony-ploughed. Fertiliser at the following rate per acre was applied in the furrows alongside the cane lines and covered by a cultivator.

360 lbs. superphosphate.
120 lbs. nitrate of soda.
60 lbs. chloride of potash.

After the first ratoon crop had been removed, the same cultivation and fertiliser treatment was repeated.

The tables, "Variety Trials—Series E," give the results obtained from harvesting the first and second ratoon crops, and give the gain or loss for each as compared with Uba over the three crops. The figures in each case are the average of five replications.

Since writing the paper already mentioned, it has become part of the Experiment Station routine to analyse the figures obtained, in tons sucrose per acre, from all plots in each experiment, for mathematical significance by statistical methods.

When this test of significance is applied to the plant cane results already published, Co.281, P.O.J.2725, Co.213 and Co.290 are all significantly better than Uba, not only at 19:1 odds but at 99:1 odds as well; but although they come in that order, the differences between them is not significant at 19:1 odds. In the first ratoon crop only Co.281 was significantly better than Uba. In this crop P.O.J.2725 dropped nearly to the level of Uba.

Co.213 and Co.290 gave yields more or less half way between Co.281 and P.O.J.2725, and were neither significantly worse than Co.281 nor significantly better than Uba and P.O.J.2725 at 19:1 odds.

In the second ratoon crop Co.281 increased its lead, being significantly better than all the other varieties. Co.290 also increased its lead and in this crop was significantly better than P.O.J.2725 as well as Uba.

The final figures for gain or loss compared with Uba over three crops place Co.281 first, Co.290 second and Co.213 third.

The conditions of soil in this experiment as regards depth, water-holding capacity, and possibly fertility as well, evidently do not suit the P.O.J. varieties of cane. Owing to an accident two plots of Co.290 had to be left out in taking the results of the first ratoon crop, which may account for the poor showing it made in that crop.

As the remaining varieties are of less general interest and are either significantly worse than Uba or are not significantly better, they are not discussed here in detail, though all the figures are given in the tables.

In this experiment, besides analysing the figures for tons sucrose per acre for significance, by statistical methods it was decided to analyse those for sucrose per cent. cane, purity of juice, and fibre per cent. cane. This was done in order to determine whether under the conditions of the experiment any significant difference between varieties in these respects could be found to exist.

The method of finding the figure for significant difference between varieties cannot be described here, but the following example shows how it is applied when found.

We will examine first sucrose per cent. cane. In the plant cane crop the significant difference at 19:1 odds was found to be 0.548 pol (sucrose) per cent. cane. At that harvesting the average pol (sucrose) per cent. cane for Uba was 14.95. Therefore varieties having an average pol (sucrose) per cent. cane of over $14.95 + 0.548$ can be said to have had a significantly higher pol (sucrose) per cent. cane than Uba. Those ranging from $14.95 + 0.548$ down to $14.95 - 0.548$ to be not significantly different from Uba in this respect, and those below $14.95 - 0.548$ to be significantly lower than Uba.

Any two varieties in the experiment can be compared with each other in the same way. The following table shows the average sucrose per cent. cane, purity of juice, and fibre per cent. cane for each variety for each crop, together with the significant error of difference in each case.

VARIETY TRIAL.—SERIES E. FIRST RATOONS.

Harvested at 24 months old, 23rd August/4th September, 1934.

	Co. 281.	Co. 290.	Co. 213.	CH. 64/21.	Hind's Special.	P.O.J. 2725.	Uba.	P.O.J. 2878.	P.O.J. 2727.	La Mercy Red.	P.O.J. 2714.	La Mercy Yellow.
Tons cane per acre	40.27	36.97	38.63	36.57	35.70	31.46	33.34	28.89	28.35	25.06	22.51	19.69
Increase tons cane per acre over Uba	6.93	3.63	5.29	3.23	2.36	-1.88	—	-4.45	-4.99	-8.28	-10.83	-13.65
Percentage tons cane per acre compared with Uba	120.8	110.9	115.9	109.7	107.1	94.4	—	86.7	85.0	75.2	67.5	59.1
Tons pol (sucrose) per acre.. .. .	5.95	5.02	5.26	5.17	4.98	4.65	4.65	4.26	3.81	3.36	3.29	2.74
Bonus for purity of juice according to Fahey Scale	0.26	0.19	0.21	0.21	0.16	0.20	0.19	0.17	0.09	0.12	0.14	0.10
Adjusted tons pol (sucrose) per acre	6.21	5.21	5.47	5.38	5.14	4.85	4.84	4.43	3.90	3.48	3.43	2.84
Increase tons pol per acre over Uba	1.30	0.37	0.61	0.52	0.33	—	—	-0.39	-0.84	-1.29	-1.36	-1.91
Percentage tons pol per acre compared with Uba	128.0	108.0	113.1	111.2	107.1	100.0	100.0	91.6	81.9	72.3	70.8	58.9
Pol (sucrose) % cane	14.76	13.81	13.52	14.12	13.96	14.79	13.95	14.73	13.43	13.41	14.62	13.92
Fibre % cane.. .. .	14.43	13.48	16.64	15.94	16.30	13.06	16.06	13.26	14.34	16.97	13.56	15.55
Juice: Brix	20.8	19.4	19.4	20.3	20.3	20.8	20.4	20.5	19.4	19.8	20.8	19.8
Pol (sucrose) %	19.46	17.81	18.04	18.85	18.61	19.34	18.91	19.06	17.60	18.21	19.31	18.14
Purity	93.3	92.0	92.9	92.6	91.6	93.2	92.7	93.0	90.5	92.0	93.0	91.7
Reducing sugar ratio	0.32	1.05	0.47	0.56	0.86	0.39	0.48	0.46	0.84	0.38	0.48	0.33
Total value of sucrose per acre at £5.470729 per ton	£33/19/5	£28/10/-	£29/18/5	£29/8/7	£28/2/4	£26/10/7	£26/9/6	£24/4/8	£21/6/8	£19/0/9	£18/15/3	£15/10/8
Value of gain or loss compared with Uba for this crop	£7/9/11	£2/0/6	£3/8/11	£2/19/1	£1/12/10	£0/1/1	—	£2/4/10	£5/2/10	-£7/8/9	-£7/14/3	-£10/18/10
General mean = 4.374 tons sucrose per acre.												
Percentage of general mean.. .. .	136.0	114.8	120.3	118.2	113.9	106.3	106.3	97.4	87.1	76.8	75.2	62.7

Significant error of difference between varieties at 19 : 1 odds = 0.738 tons sucrose per acre

Percentage significant error of difference between varieties at 19 : 1 odds = 16.9%

Value of significant difference between varieties per acre at 19 : 1 odds = £4 0s. 9d.

} for this crop.

Gain or Loss compared with Uba.

	Co. 281.	Co. 290.	Co. 213.	CH. 64/21.	Hind's Special.	P.O.J. 2725.	Uba.	P.O.J. 2878.	P.O.J. 2727.	La Mercy Red.	P.O.J. 2714.	La Mercy Yellow.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Plant cane	6 8 0	5 3 7	5 15 1	1 4 7	-2 1 9	5 15 2	—	-1 9 5	-0 18 9	-2 17 0	-1 16 4	-3 12 8
First ratoon	7 9 11	2 0 6	3 8 11	2 19 1	1 12 10	0 1 1	—	-2 4 10	-5 2 10	-7 8 9	-7 14 3	-10 18 10
Total gain or loss compared with Uba over two crops	£13 17 11 gain.	7 4 1 gain.	9 4 0 gain.	4 3 8 gain.	0 8 11 loss.	5 16 3 gain.	—	3 14 3 loss.	6 1 7 loss.	10 5 9 loss.	9 10 7 loss.	14 11 6 loss.

VARIETY TRIAL.—SERIES E. SECOND RATOONS.

Harvested at 22 months old, 16th to 25th June, 1936.

	Co. 281.	Co. 290.	Co. 213.	CH. 64/21.	Hind's Special.	P.O.J. 2725.	Uba.	P.O.J. 2878.	P.O.J. 2727.	La Mercy Red.	P.O.J. 2714.	La Mercy Yellow.
Tons cane per acre	37.88	32.45	31.22	29.62	28.33	24.67	26.67	21.92	22.69	20.88	16.95	14.87
Increase tons cane per acre over Uba	+11.21	+5.78	+4.55	+2.95	+1.66	-2.00	—	-4.75	-3.98	-5.79	-9.72	-11.89
Percentage tons cane per acre compared with Uba	142.0	121.7	117.1	111.1	106.2	92.5	100.0	82.2	85.1	78.3	63.6	55.4
Tons pol (sucrose) per acre	5.52	4.48	3.98	3.93	3.85	3.66	3.47	3.08	3.07	2.74	2.24	1.82
Increase tons pol per acre over Uba	+2.05	+1.01	+0.51	+0.46	+0.38	+0.19	—	-0.39	-0.40	-0.73	-1.23	-1.65
Percentage tons pol per acre compared with Uba	159.1	129.1	114.7	113.3	111.0	105.5	100.0	88.8	88.5	79.0	64.6	52.4
Pol (sucrose) % cane	14.57	13.81	12.76	13.25	13.60	14.85	13.00	14.04	13.52	13.10	13.20	12.31
Fibre % cane	14.33	14.20	14.14	15.54	15.67	13.57	15.57	13.77	14.44	15.14	14.35	15.31
Juice: Brix	20.0	18.9	18.3	19.2	19.8	20.4	18.7	19.1	19.2	18.8	18.4	17.8
Pol (sucrose) %	18.81	17.40	16.75	17.57	17.97	18.95	17.00	17.64	17.43	17.36	16.73	16.19
Purity	94.0	91.9	91.4	91.3	90.5	93.0	90.5	92.4	91.0	92.4	90.9	91.0
Mgms. per 100 ml. Phosphate content	40.4	40.4	40.0	49.6	38.5	39.2	44.7	40.6	66.4	39.6	38.1	19.0
Potash content	76.4	97.9	102.1	191.7	122.0	99.6	158.5	75.5	175.9	76.4	107.1	195.9
Reducing sugar ratio	0.51	1.33	1.77	2.05	1.80	1.24	2.56	1.59	2.08	0.59	2.56	0.72
Total value of sucrose per acre at £5.76923 per ton	£31/16/11	£25/16/11	£22/19/3	£22/13/6	£22/4/3	£21/2/4	£20/0/5	£17/15/5	£17/14/3	£15/16/2	£12/18/5	£10/10/-
Value of gain or loss compared with Uba for this crop	+11/16/6	+5/16/6	+2/18/10	+2/13/1	+2/3/10	+1/1/11	—	+2/5/0	-2/6/2	-4/4/3	-7/2/-	-9/10/5
General mean = 3.486 tons sucrose per acre.												
Percentage of general mean	158.3	128.5	114.2	112.7	110.4	105.0	99.5	88.4	88.1	78.6	64.3	52.2

Significant error of difference between varieties at 19:1 odds = 0.609 tons sucrose per acre }
 Percentage significant error of difference between varieties at 19:1 odds = 17.5% } for this crop.
 Value of significant error of difference between varieties at 19:1 odds = £3 10s. 3d.

Gain or Loss compared with Uba.

	Co. 281.	Co. 290.	Co. 213.	CH. 64/21.	Hind's Special.	P.O.J. 2725.	Uba.	P.O.J. 2878.	P.O.J. 2727.	La Mercy Red.	P.O.J. 2714.	La Mercy Yellow.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Plant cane	+6 8 0	+5 3 7	+5 15 1	+1 4 7	-2 1 9	+5 15 2	—	-1 9 5	-0 18 9	-2 17 0	-1 16 4	-3 12 8
First ratoon	+7 9 11	+2 0 6	+3 8 11	+2 19 1	+1 12 10	+0 1 1	—	-2 4 10	-5 2 10	-7 8 9	-7 14 3	-10 18 10
Second ratoon	+11 16 6	+5 16 6	+2 18 10	+2 13 1	+2 3 10	+1 1 11	—	-2 5 0	-2 6 2	-4 4 3	-7 2 0	-9 10 5
Total gain or loss compared with Uba over three crops	£25 14 5 gain.	13 0 7 gain.	12 2 10 gain.	6 16 9 gain.	1 14 11 gain.	6 18 2 gain.	— loss.	5 19 3 loss.	8 7 9 loss.	14 10 0 lo ss.	16 12 7 loss.	24 1 11 loss.

POL (SUCROSE) PER CENT. CANE.

	Error of difference between var. at 19:1 odds.	Significantly higher than Uba if over.	Significantly lower than Uba if under.	Co. 281.	Co. 290.	Co. 213.	CH. 64/21.	Hind's Special.	P.O.J. 2725.	Uba.	P.O.J. 2878.	P.O.J. 2727.	La Mercy Red.	P.O.J. 2714.	La Mercy Yellow
Plant cane crop ..	0.55	15.50	14.40	16.04	14.91	15.50	15.31	14.16	17.20	14.95	16.06	15.68	14.30	15.93	14.50
First ratoon crop ..	0.42	14.37	13.53	14.76	13.81	13.52	14.12	13.96	14.79	13.95	14.73	13.43	13.41	14.62	13.92
Second ratoon crop ..	0.59	13.59	12.41	14.57	13.81	12.76	13.25	13.60	14.85	13.00	14.04	13.52	13.10	13.20	12.31

Significantly higher than Uba.

Plant cane crop: Co.281, P.O.J.2725, P.O.J.2878, P.O.J.2714, P.O.J.2727, Co.213.

First ratoon crop: Co.281, P.O.J.2725, P.O.J.2878, P.O.J.2714.

Second ratoon crop: Co.281, P.O.J.2725, P.O.J.2878, Co.290, Hind's Special.

Significantly lower than Uba.

Plant cane crop: La Mercy Red, Hind's Special.

First ratoon crop: La Mercy Red, Co.213, P.O.J.2727.

Second ratoon crop: La Mercy Yellow only.

FIBRE PER CENT. CANE.

	Error of difference between var. at 19:1 odds.	Significantly higher than Uba if over.	Significantly lower than Uba if under.	Co. 281.	Co. 290.	Co. 213.	CH. 64/21.	Hind's Special.	P.O.J. 2725.	Uba.	P.O.J. 2878.	P.O.J. 2727.	La Mercy Red.	P.O.J. 2714.	La Mercy Yellow
Plant cane crop ..	0.52	16.73	15.69	15.37	13.17	16.16	14.79	17.07	12.90	16.21	14.31	14.68	17.36	13.16	15.52
First ratoon crop ..	0.68	16.74	15.38	14.43	13.48	16.64	15.94	16.30	13.06	16.06	13.26	14.34	16.97	13.56	15.55
Second ratoon crop ..	0.50	16.07	15.07	14.33	14.20	14.94	15.54	15.67	13.57	15.57	13.77	14.44	16.10	14.35	15.67

Significantly higher than Uba.

Plant cane crop: Hind's Special and La Mercy Red.

First ratoon crop: La Mercy Red.

Second ratoon crop: La Mercy Red.

Significantly lower than Uba.

Plant cane crop: Co.281, Co.290, CH.64/21, P.O.J.2725, P.O.J.2878, P.O.J.2727, P.O.J.2714, La Mercy Yellow.

First ratoon crop: Co.281, Co.290, Co.213, P.O.J.2725, P.O.J.2878, P.O.J.2727, P.O.J.2714.

Second ratoon crop: Co.281, Co.290, Co.213, P.O.J.2725, P.O.J.2878, P.O.J.2727, P.O.J.2714.

PURITY OF JUICE.

	Error of difference between var. at 19:1 odds.	Significantly higher than Uba if over.	Significantly lower than Uba if under.	Co. 281.	Co. 290.	Co. 213.	CH. 64/21.	Hind's Special.	P.O.J. 2725.	Uba.	P.O.J. 2878.	P.O.J. 2727.	La Mercy Red.	P.O.J. 2714.	La Mercy Yellow
Plant cane crop ..	1.95	90.25	86.35	93.1	89.7	90.7	90.0	86.4	92.6	88.3	90.8	90.2	91.3	90.9	91.3
First ratoon crop ..	0.49	93.19	92.21	93.3	92.0	92.9	92.6	91.6	93.2	92.7	93.0	90.5	92.0	93.0	91.7
Second ratoon crop ..	0.17	90.67	90.33	94.0	91.9	91.4	91.3	90.5	93.0	90.5	92.4	91.0	92.4	90.9	91.0

Significantly higher than Uba.

Plant cane crop: Co.281, Co.213, P.O.J.2725, P.O.J.2878, La Mercy Red, P.O.J.2714, La Mercy Yellow.

First ratoon crop: Co.281, P.O.J.2725.

Second ratoon crop: Co.281, Co.290, Co.213, CH./6421, P.O.J.2725, P.O.J.2878, P.O.J.2727, La Mercy Red, P.O.J.2714, La Mercy Yellow.

Significantly lower than Uba.

Plant cane crop: None.

First ratoon crop: Co.290, Hind's Special, P.O.J.2727, La Mercy Yellow.

Second ratoon crop: None.

The varieties not mentioned in the above summaries did not show any significant differences from Uba.

VARIETY TRIAL—Series G.

This is a trial of six unreleased varieties (five Co. varieties and P.O.J.234) against the released varieties Co.281, Co.290 and Uba. It was planted in the middle of September, 1933, in Field E2. This field lies on a moderate slope facing in a westerly direction. The soil is a heavy dark coloured loam and the field has always given good crops of cane.

At planting time the fertilisers applied in the furrow were:—

600 lbs. per acre superphosphate.
120 lbs. per acre sulphate of ammonia.
60 lbs. per acre chloride of potash.

780 lbs. per acre.

The plant cane crop made a very good start, followed by a favourable growing season, and was harvested at 14 months old.

After the plant cane crop had been harvested the trash was raked into alternate rows and the cleared rows were pony-ploughed and cultivated.

The following tables give the results of the plant cane crop and first ratoon crop. The figures in each case are the average of six replications.

Taking tons sucrose yielded per acre:—

The following were significantly higher than Uba—

Plant cane crop: Co.290, Co.281, Co.270, Co.284, Co.223.

First ratoon crop: Co.290, Co.281.

The following were significantly lower than Uba—

Plant cane crop: None.

First ratoon crop: Co.223, P.O.J.234.

The following were not significantly different from Uba—

Plant cane crop: Co.313, Co.243, P.O.J.234.

First ratoon crop: Co.270, Co.284, Co.313, Co.243.

Taking the leading varieties, Co.290 and Co.281, the former was significantly better than the latter in the plant cane crop. In the first ratoon crop Co.290 lost its lead and was actually a little lower than Co.281, though the difference between them was not significant.

Co.270 was very close to Co.290 and significantly higher than Co.281 in the plant cane crop, but dropped to be significantly lower than both Co.281 and Co.290 in the first ratoon crop.

Other indications from our propagation plots confirm the impression that Co.270 is not likely to ratoon as strongly as Co.281 and Co.290.

None of the other varieties in this experiment show promise of being likely to become profitable varieties under our conditions.

VARIETY TRIAL.—SERIES G.

Plane Cane Crop, harvested at 14 months old, November, 1934.

	Co. 281.	Co. 290.	Co. 270.	Co. 284.	Uba.	Co. 313.	Co. 243.	Co. 223.	P.O.J. 234.
Tons cane per acre	34.40	39.83	40.22	33.88	27.73	22.94	29.46	34.98	27.90
Increase tons cane per acre over Uba ..	6.67	12.10	12.49	6.15	—	-4.79	1.73	7.25	0.17
Percentage tons cane per acre compared with Uba	124.0	143.6	145.0	122.2	100.0	82.6	106.2	126.1	100.6
Tons pol (sucrose) per acre	5.44	6.26	6.07	4.79	4.17	3.62	4.27	5.07	4.45
Bonus for purity according to Fahey Scale	0.19	0.16	0.21	0.12	0.09	0.09	0.15	0.14	0.21
Tons pol (sucrose) corrected per acre ..	5.63	6.42	6.28	4.91	4.26	3.71	4.42	5.21	4.66
Increase tons pol per acre over Uba ..	1.37	2.16	2.02	0.65	—	0.55	0.16	0.95	0.40
Percentage tons pol per acre compared with Uba	132.2	150.8	147.5	115.3	100.0	89.4	103.8	122.4	109.4
Pol (sucrose) % cane	15.82	15.71	15.09	14.15	15.02	15.76	14.51	14.49	15.96
Fibre % cane	13.89	11.96	14.34	16.22	14.75	15.23	15.60	14.95	15.20
Juice: Brix	22.4	21.6	22.43	21.66	22.3	22.75	20.98	20.5	22.2
Pol (sucrose) %	20.74	19.78	20.75	19.70	20.18	20.84	19.41	18.91	21.00
Purity	92.6	91.6	92.5	90.9	90.5	91.6	92.5	92.2	94.6
Reducing sugar ratio	0.50	0.98	0.48	0.45	1.87	0.52	0.64	1.48	0.78
Total value of sucrose per acre at £5.470729 per ton	£30/16/-	£35/2/5	£34/7/1	£26/17/3	£23/6/1	£20/5/11	£24/3/7	£28/10/-	£25/9/11
Value of gain or loss compared with Uba for this crop	£7/9/11	£11/16/4	£11/1/-	£3/11/2	—	£3/0/2	£0/17/6	£5/3/11	£2/3/10

General mean = 5.06 tons sucrose per acre.

Percentage of general mean 111.3 126.9 124.1 97.0 84.2 73.3 87.4 103.0 92.1

Significant error of difference between varieties at 19:1 odds = 0.576 tons sucrose per acre.

Percentage significant error of difference between varieties at 19:1 odds = 11.4%.

Value of significant difference between varieties per acre at 19:1 odds = £3 3s. 0d.

VARIETY TRIAL.—SERIES G.

First Ratoon Crop, harvested at 20 months old, 28th July, 1936.

	Co. 281.	Co. 290.	Co. 270.	Co. 284.	Uba.	Co. 313.	Co. 243.	Co. 223.	P.O.J. 234.
Tons cane per acre	44.99	44.07	37.93	37.53	34.11	31.86	35.23	29.41	23.69
Increase tons cane per acre over Uba ..	10.88	9.96	3.83	3.42	—	-2.25	1.12	-4.70	-10.42
Percentage tons cane per acre compared with Uba	131.9	129.2	111.2	110.2	100.0	93.4	96.7	86.2	69.5
Tons pol (sucrose) per acre	6.54	6.45	5.31	5.09	4.90	4.54	4.44	3.80	3.49
Increase tons pol per acre over Uba ..	1.64	1.55	0.41	0.19	—	-0.36	-0.46	-1.10	-1.41
Percentage tons pol per acre compared with Uba	133.5	131.6	108.4	103.9	100.0	92.7	90.6	77.6	71.2
Pol (sucrose) % cane	14.54	14.64	13.99	13.55	14.36	14.26	12.61	12.93	14.72
Fibre % cane	14.30	13.56	16.22	17.34	15.48	16.69	15.56	14.71	14.97
Juice: Brix	20.6	20.4	20.6	20.5	20.7	20.9	18.5	18.5	20.7
Pol (sucrose) %	19.43	18.80	19.09	18.84	19.27	19.47	17.19	16.91	19.44
Purity	94.2	92.4	92.7	91.8	93.2	93.2	92.9	91.7	94.0
Mgms. per ml.: Phosphate content ..	47.6	66.4	49.6	36.5	38.9	53.3	19.0	24.0	44.7
Potash content	186.36	175.96	191.73	108.73	129.48	156.87	195.38	195.05	158.53
Reducing sugar ratio	0.31	0.43	0.51	0.32	0.51	0.32	0.34	1.09	0.31
Total value of sucrose per acre at £5.76923 per ton	£37/14/7	£37/4/3	£30/12/8	£29/7/4	£28/5/5	£26/3/10	£25/12/4	£21/18/6	£20/2/8
Value of gain or loss compared with Uba for this crop	£9/9/2	8/18/10	2/7/3	1/1/11	—	-2/1/7	-2/13/1	-6/6/11	-8/2/9
General mean = 4.95 tons sucrose per acre.									
Percentage of general mean	132.1	130.3	107.3	102.8	99.0	91.7	89.7	76.8	70.5

Significant error of difference between varieties at 19:1 odds = 0.986 tons sucrose per acre.

Percentage significant error of difference between varieties at 19:1 odds = 20%.

Value of significant difference between varieties per acre at 19:1 odds = £5 13s. 9d.

Gain or Loss compared with Uba.

	Co.281.	Co.290.	Co.270.	Co.284.	Co.313.	Co.243.	Co.223.	P.O.J.234.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Plant cane	7 9 11	11 16 4	11 1 0	3 11 2	-3 0 2	0 17 6	5 3 11	2 3 10
First ratoon	9 9 2	8 18 10	2 7 3	1 1 11	-2 1 7	-2 13 1	-6 6 11	-8 2 9
Total gain or loss compared with Uba over two crops	<u>16 19 1</u>	<u>20 15 2</u>	<u>13 8 3</u>	<u>4 13 1</u>	<u>5 1 9</u>	<u>1 15 7</u>	<u>1 3 0</u>	<u>5 18 11</u>
	gain.	gain.	gain.	gain.	loss.	loss.	loss.	loss.

VARIETY TRIAL—Series H.

This is a trial of what has so far proved the four best Co. varieties at the Experiment Station with Sin Nombre.

It was planted at the end of November, 1934, in Field B1. This field is nearly level. The soil is a heavy dark coloured loam overlying a clay subsoil. Cane grows well on this field when moisture conditions are favourable, but it suffers from drought rather quickly when dry weather sets in.

The following application of fertiliser was given in the furrow at the time of planting:—

600 lbs. per acre superphosphate.
120 lbs. per acre sulphate of ammonia.
60 lbs. per acre chloride of potash.

—
780 lbs. per acre.

The weather after planting was very dry and there were many blanks, especially in Co.290 and Co.301. These were filled in with setts already germinated after the rains came in February, 1936, and eventually a fairly good stand was obtained, though the growth was decidedly uneven.

The following table gives the average results from six replications of each variety:—

VARIETY TRIAL.—SERIES H.

Plant Cane Crop, harvested at 22½ months old, 1st to 9th October, 1936.

	Co.301.	Co.281.	Co.290.	Co.270.	Sin Nombre.
Tons cane per acre	45.18	38.19	35.68	38.81	28.33
Increase tons cane per acre over Co.281	+6.99	—	-2.51	+0.62	-9.96
Percentage tons cane per acre compared with Co.281	118.3	100.4	93.4	101.6	73.9
Tons pol (sucrose) per acre	7.52	6.56	6.02	5.77	4.16
Increase tons pol per acre over Co.281	+0.96	—	-0.54	-0.79	-2.40
Percentage tons pol per acre compared with Co.281 ..	114.6	100.0	91.8	88.0	63.4
Pol (sucrose) % cane	16.64	17.19	16.86	14.87	14.72
Fibre % cane	13.94	15.44	15.30	14.93	15.55
Juice: Brix	22.1	23.1	21.8	21.1	22.1
Pol (sucrose) %	20.55	21.51	20.23	18.23	19.56
Purity	93.1	93.0	92.7	88.9	88.6
Mgms. per 100 ml.: Phosphate content	70.2	66.6	55.5	68.4	87.6
Potash content	109.56	152.72	157.70	98.77	144.42
Reducing sugar ratio	2.26	0.30	0.42	2.01	1.14
Total value of sucrose per acre at £5.76923 per ton ..	£43/7/8	£37/16/11	£34/14/8	£33/5/9	£24/-/-
Value of gain or loss compared with Co.281 for this crop	£5/10/9 gain.	—	£3/2/3 loss.	£4/11/2 loss.	£13/16/11 loss.
General mean = 6.006 tons sucrose per acre.					
Percentage of general mean	125.2	109.2	100.2	96.1	69.3

Significant error of difference between varieties at 19 : 1 odds = 0.726 tons sucrose per acre.

Percentage significant error of difference between varieties at 19 : 1 odds = 12.1%.

Value of significant difference between varieties per acre at 19 : 1 odds = £4 3s. 9d.

In yield of tons sucrose per acre, Co.301 was significantly higher than Co.281 in this crop. Co.290 was lower than Co.281, but not significantly so at 19 : 1 odds.

The other two varieties were both significantly lower than Co.281.

This is the first experiment to be reaped at the Experiment Station which includes Co.301. The very gratifying result which this variety has given in the first harvesting of this experiment must therefore be considered as little more than an indication that this is a variety of promise, until it is confirmed by further trials and until its ratooning powers have been tested.

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