ANNUAL SUMMARY OF CHEMICAL LABORATORY REPORTS FROM SOUTH AFRICAN SUGAR FACTORIES, SEASON 1938-39

By H. H. DODDS and W. O. CHRISTIANSON

The 1938-39 season continues the advance in cane and sugar production of recent years, notwithstanding difficulties in finding markets for the additional product.

This year the output of sugar was 522,732 tons of 2,000 lbs. (474,220 metric tons), produced from 4,658,962 short tons (4,226,560 metric tons) of cane, representing a sugar yield of 11.22 per cent of weight of cane, or conversely 8.91 tons of cane per ton of sugar.

Of the 522,732 short tons of sugar produced, there were manufactured under the main agreement 489,719 tons, of which 1,644 tons were in excess of quota, and 33,016 tons made under supplementary agreements, so-called " B " pool.

Weather Conditions.

On the whole the season was a favourable one from the weather standpoint though there were some adverse factors..

The nine months from March to November of the year 1937 had only 15.94 inches of rain, which is two-thirds of normal, so that most of the cane harvested in 1938 had come through a very severe and prolonged dry season during the first year of growth. The belated rainy season of 1937-38 caused another setback to the growth of cane in March, which, normally the wettest month in the year with 4.93 inches of rain, had only 0.40 inches in 1938.

However, when the cane came to be harvested later in 1938 it had made at least fair growth, and certainly there was far too much of it for the industry's quota.

Late rains in April and again in June and July, which had nearly three times their normal light rains delayed the ripening of the crop so that the sucrose content of the cane was unusually low at the opening of the season in May and June and did not reach normal until August. From September onwards, however, the sucrose content was much above the average of the preceding ten years.

Quality of Cane.

The same may be said of the purity of the juice which was only 83 in May or much below normal, but reached the normal of 84.4 for June, and thereafter was high with a peak of over 87 for the four months August to November inclusive.

The fibre content of the cane was very low throughout the season according to our standards, and in August reached the absolute minimum of any monthly period in this country of 14.17 per cent cane.

Another seasonal factor is the fact that for the first few months of the season the crop consists almost entirely of ratoons which gradually give way to plant cane harvested during the later periods.

A third most important factor is that Uba cane is now largely confined to the older ratoon crops and is therefore harvested principally during the first part of the season, other varieties predominating later.

Of the whole crop 32.2 per cent consisted of Uba, and 67.8 per cent of all other varieties. One or two factories have not stated their relative proportions of the new varieties, but the following may be taken to be approximately correct over the crop.

	Per cent of Crop 1938-39 Season
Uba	32.2
Co. 290	35.2
Co. 281	21.0
Co. 301	0.3
P.O.J. (mainly 2725, with a little 2878)	11.3

The proportions vary enormously with individual factories and localities. Thus the three northern factories recorded only 13.6 per cent of Uba, and Umfolozi as much as 56.3 per cent of P.O.J. cane, but only 10 per cent of Co.290.

Three North Coast factories and one South Coast factory milled between 50 and 60 per cent of Uba cane.

The graphs illustrating the monthly records of quality of cane show the usual peak of sucrose content of cane and of purity of mixed juice during the August/November period inclusive.

The fibre content of cane, however, was at a minimum in July and August instead of September as in most previous years.

Factory Performance.

The recovery figures showed similar seasonal changes with a peak period from August to November.

The overall recovery reached a new high general level for this country in August, 82.33, and a boiling house recovery for the same month of 89.36.

The extraction, however, reached its maximum of 92.29 in October, when the sucrose content of cane was at its highest.

The ratio of cane to sugar was at its lowest in October also, 8.30.

The extraction, 91.90, boiling house recovery, 88.48, and overall recovery, 81.31, for the season are all higher than ever before, and the ratio of cane to sugar, 8.89, lower only in the 1937-38 season, when, however, the sucrose content of the cane was considerably higher because of more favourable weather conditions.

The purity of final molasses, 43.12, is still very high, however, accounting for high losses of sucrose in molasses and a low boiling house recovery, compared with other countries.

The high moisture content of the bagasse, 52.17 per. cent, is also very high compared with other countries, and together with the high fibre content of cane, tends to a relatively low extraction.

Nevertheless, if the improvement shown in recent years is maintained for a few more seasons, our extraction and recovery figures will compare favourably with those of the most efficient of sugar producing countries.

One most valuable asset in this country is the high sucrose content of cane, promoted by our cool dry season, so that only Queensland with a seasonal temperature range comparable to ours, is superior in this respect.

As last year the season began very early, over 100,000 tons of cane being crushed before the end of May, and continued very late, 80,000 tons of cane being crushed after the end of December.

As stated above, the cane was late in ripening, and the losses due to premature harvesting were correspondingly heavy.

The 832,668 tons of cane harvested during May and June yielded 82,520 tons of sugar, or 10.09 tons of cane per ton of sugar. The 2,726,849 tons of cane harvested during the peak period of August to November inclusive yielded 322,931 tons of sugar, or 8.44 tons of cane per ton of sugar. Consequently, if the 82,520 tons of sugar manufactured during May and June had been made during the August-November period, it would have required only 696,469 tons of cane, a saving of 136,200 tons of cane.

Individual Factory Records.

The general improvement in quality of cane and in sugar house practice is well illustrated in several instances.

The highest sucrose content of cane, 14.41 per cent was recorded at factory No. 21, the only other factory with a sucrose content of over 14 per cent being No. 11 with 14.06.

Factory No. 10 had a fibre content of cane of only 13.76 per cent, which is probably the lowest ever recorded for a whole season by any South African factory. Forty-two per cent of the cane crushed at this factory was Co.290, and 20 per cent P.O.J. (mainly 2725).

The highest purity of mixed juice was 87.60 at factory No. 19, and the lowest reducing sugar ratio, 2.17, at factory No. 16, as last season.

The highest extraction is, as usual, gained by factory No. 1 with 94.79. This corresponds to a reduced extraction of 95.60 based on a standard fibre content of 12.5 per cent.

This factory also gains the highest overall recovery of 85.48, corresponding to a reduced overall recovery of 85.33. These are the highest ever recorded by any South African factory.

The lowest ratio of cane to sugar, 8.43, is shared by factories 1 and 20, but taking the higher polarization of the former factory into account, No. 1 has a ratio of cane to 96° sugar of 8.18 and No. 20, 8.21.

No. 1 factory also shows the lowest milling loss, 4.96, the lowest primary juice loss, 30.80, and the highest recovery efficiency, 103.29.

The highest recovery of sucrose on mixed juice (boiling house recovery) is shown as usual by factory No. 16. This factory gains once more the lowest purity of final molasses, 36.22, and the lowest moisture per cent bagasse, 47.80.

The largest quantity of cane crushed, 530,976 short tons, and largest output of sugar, 60,803 short tons, are as before recorded by factory No. 5. This is the largest quantity of cane crushed and sugar manufactured by any South African factory in a single season.

The crushing rate at this factory is again very high, 125.68 tons of cane per hour, but is surpassed this season by factory No. 1 which crushed an average for the season of 129.09 tons of cane per hour in a single train of mills, with a fibre content of cane of 14.47 per cent and 40.17 imbibition water per cent cane.

Although filter station returns are by no means complete, the losses of sucrose in filter cake for the industry as a whole show an appreciable decline, probably due to the extended use of continuous filters.

As before our records include the 17 South African factories believed to have complete chemical control. These account for 96.6 per cent of the total sugar produced, the remaining 3.4 per cent being from six smaller factories.

World Production of Sugar.

The estimated world output of sugar for the 1938/39 season according to F. O. Licht, shows a decline over the previous year of about a million tons. There was also a reduced production of sugar compared with the previous year in the British Empire, mainly due to a decline in production in India of 683,000 tons.

Consequently, the slight increase in production in South Africa corresponds to a somewhat larger proportion of the world's output than before, though still a very modest percentage.

Licht's Estimates of World Output of Sugar 1938/39 Season.

British Empire.	Metric tons Sugar	Percentage of total
India	2,692,000*	48.6
Australia	803,000	14.5
South Africa	474,200	8.6
British West Indies	471,700	8.5
Great Britain	325,000	5.9
Mauritius	300,000	5.4
British Guiana	190,000	3.4
Fiji	137,000	2.5
Canada	75,000	1.3
Ireland	73,000	1.3
Total	5,540,900	100.0

*Including 3,048,000 tons of gur calculated at 50 per cent raw sugar value.

Total World Output:

	Tons	Per cent of total
Cane Sugar	18,085,200	63.1
Beet Sugar	10,598,600	36.9
Total	28,683,800	100.0

South African Output 522,732 short tons (474,220 metric tons).

This corresponds to 8.6 per cent of total British production, 2.6 per cent of world cane sugar output, and 1.7 per cent of total world sugar manufacture.

Following are the figures for sugar production in South Africa since 1891, and for sugarcane since 1924:—

Sugar Production in South Africa (Short Tons) from 1891-92 to 1938-39.

Season	Rainfall	Sugar Produced
1891-92	42.33	12,235
1892-93	35.49	29,043
1893-94	67.62	18,334
1894-95	32.29	21,070
1895-96	53.15	22,708
1896-97	40.91	6,025
1897-98	34.04	20,254
1898-99	40.83	32,493
1900-01	27.93	17,996
1901-02	52.02	40,054
1902-03	47.32	19,460
1903-04	33.53	33,767
1904-05	37.03	19,238
1905-06	49.85	29,795
1906-07	37.32	23,497
1907-08	47.57	27,130
1908-09	41.05	35,832
1909-10	43.56	86,790
1910-11	41.79	82,000
1911-12	52.43	92,000
1912-13	39.91	96,000
1913-14	50.00	92,153
1914-15	33.25	102,653
1915-16	39.64	113,358
1916-17	27.50	114,709
1917-18	78,67	104,921
1918-19	37.75	150,214
1919-20	32.08	189,183
1920-21	51.99	143,730
1921-22	34.32	151,500
1922-23	34.32	158,000
1923-24	26.36	203,300

Season	Cane Crushed	Rainfall	Sugar Produced	Ratio Cane/ Sugae
1924-25	1,729,344	29.93	161,500	10.71
1925-26	2,638,000	43.80	239,463	11.02
1926-27	2,335,406	25.42	242,662	9.62
1927-28	2,482,931	42.46	247,300	10.04
1928-29	2,885,252	27.56	295,934	9.75
1929-30	3,005,663	43.83	298,635	10.06
1930-31	3,803,883	30.03	393,205	9.67
1931-32	3,130,783	28.01	325,899	9.61
1932-33	3,489,960	41.36	358,905	9.72
1933-34	3,673,375	27.14	391,173	9.39
1934-35	3,874,215	39.42	358,738	10.80

Season	Cane Crushed	Rainfall	Sugar Produced	Ratio Cane/ Sugar
1935-36	3,867,536	53.25	417,289	9.27
1936-37	4,180,973	45.36	446,409	9.37
1937-38	4,489,022	33.21	507,219	8.85
1938-39	4,658,962	37.97	522,732	8.91

Acknowledgments.

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South African Sugar Association,
Experiment Station,
Mount Edgecombe,
March, 1939.

APPENDIX

Field Returns 1937-38 Crop—Compiled from the Union Department of Census Reports for Sugar Cane owned by European Planters.

These figures do not refer to the same season as the factory returns just quoted but to the previous crop.

Progressive Changes in the Proportion of Uba Cane in Cultivation and Comparative Yield Results.

These show that Uba is rapidly passing out of cultivation. While there was still 41.2 per cent of all cane lands under Uba it was largely confined to second and third ratoons. Thus only 19.7 per cent of first ratoons and 5.2 per cent of plant cane crops were under Uba in April, 1938.

The Port Shepstone area records 100 per cent of plant cane fields under the new varieties, followed by Lower Umfolozi with 98.4 per cent plant cane, 89.9 per cent first ratoons, and 73.1 per cent of all cane fields under Non-Uba canes.

However, as stated, these figures refer to European planters only, and the small proportion of sugar cane grown by Indians and natives, which was calculated at 9 per cent of the total in 1937 appears to contain a relatively large proportion of Uba.

The yield of cane per acre for the 1937/38 season was 20.38 tons from Uba, mainly second and later ratoons as already noted, and 28.91 tons from all other varieties, mainly plant cane and first ratoons. The total yield for the crop as a whole was 23.75 tons of cane per acre which is the highest on record for this country, the average yield for the previous 11 seasons, 1926 to 1936 inclusive, being 20.35 tons, and the previous maximum 22.39 tons in 1930.

Areas of Cane Harvested.

The area of cane harvested, 171,835 acres, showed a considerable fall from the previous season, and was the smallest since 1933. This is, no doubt, due to the quota system for cane coming into operation.

The decrease was recorded for all districts except Eshowe and Hlabisa, in Zululand, which showed slight increases in total area of cane harvested, the decrease being most marked in the Lower Umfolozi, Lower Tugela, and Durban districts There were no marked changes in the proportion of area harvested by districts, Hlabisa, Eshowe and Umzinto showing slight increases, mainly at the expense of Durban, Lower Tugela and Lower Umfolozi areas.

Yield of Cane Harvested.

It was noted in our report for last season that cane production for the 1937/38 season reached a new high level. This increase was accounted for by the Port Shepstone, Umzinto and all Zululand districts; while Durban, Inanda and Lower Tugela, that is to say the coastal district between the Umkomaas and Tugela rivers, showed considerable decreases in cane harvested.

Nevertheless the Lower Tugela division continues to produce by far the biggest quantity of cane, 1,138,342 tons, with Lower Umfolozi now second with 713,675 tons, Umzinto third with 692,159 tons, Inanda having dropped from second to fourth place with 615,227 tons.

Yields of Cane Per Acre.

All districts share in the remarkable increase in yield of cane per acre over a single season, the biggest improvement being shown by the two "fag-end" districts Port Shepstone, 13.51 tons to 21.53 tons per acre (Uba 19.42, Non-Uba 25.54), and Hlabisa from 18.60 tons to 25.36 tons (Uba 17.89, Non-Uba 33.22). Lower Umfolozi also shows a highly significant increase in yield of cane per acre from 23.04 tons to 28.81, (Uba 21.34, Non-Uba 34.82), also Umzinto 18.22 to 22.41 (Uba 19.94, Non-Uba 27.06).

The smallest increases were recorded in the central coastal area between the Umkomaas and Tugela rivers.

The Lower Umfolozi division now regains the premier position in yield of cane per acre for the first time since 1926, while Inanda with 26.19 tons of cane per acre (Uba 24.21, Non-Uba 31.62) falls to second place.

As anticipated by us in our report two years ago, Zululand has now regained its superiority in yield of cane over the rest of Natal, the average yield for the 1937/38 season in Zululand being 24.68 tons per acre (Uba 19.03, Non-Uba 31.06), with the rest of Natal 23.27 tons per acre (Uba 20.95, Non-Uba 27.47).

This is obviously due to the greater benefits conferred on Zululand by the new varieties, and to some extent the greater readiness of the planters there to use them. The percentage of Uba canes in Zululand was 30.1 per cent and for the rest of Natal 46.8 per cent.

This superiority will probably be found to have increased in the crop recently harvested because of the relatively high rainfall enjoyed by Zululand in 1937.

FINAL MANUFACTURING RESULTS, NATAL SUGAR FACTORIES, SEASON 1938—39.

FACTORY NUMBER	1	2	4	5	6	8	9	10	11	12	14	15	16	18	19	20	21	SEASON.
Tons of 2,000 lbs. Cane crushed	500,196	320,694	221,371	530,976	355,855	200,570	94,877	343,997	333,258	436,911	300,581	152,769	87,484	160,374	108,788	155,577	183,790	**4,488,068**
Cane crushed—*metric tons*	*453,778*	*290,934*	*200,828*	*481,701*	*322,832*	*181,957*	*86,072*	*312,074*	*302,332*	*396,366*	*272,687*	*138,592*	*79,365*	*145,491*	*98,692*	*141,139*	*166,734*	*4,071,575*
Tons of 2,000 lbs. Sugar bagged and estimated	59,348	31,051	24,931	60,803	41,102	22,271	10,818	39,725	36,204	48,420	34,440	16,607	10,368	17,902	11,204	18,455	21,227	**504,876**
Sugar bagged and estimated—*metric tons*	*53,841*	*28,169*	*22,617*	*55,160*	*37,288*	*20,204*	*9,814*	*36,039*	*32,844*	*43,927*	*31,244*	*15,066*	*9,406*	*16,241*	*10,164*	*16,742*	*19,257*	*458,024*
Tons Cane per ton of Sugar	8.43	10.33	8.88	8.73	8.66	9.00	8.77	8.66	9.20	9.02	8.73	9.20	8.44	8.96	9.71	8.43	8.66	**8.89**
Tons Cane per ton of Sugar calculated as Sugar of 96° Pol.	8.18	10.13	8.63	8.49	8.45	9.00	8.53	8.39	8.91	8.79	8.50	8.92	8.22	8.71	9.47	8.21	8.40	**8.66**
Time Crushing per cent. Available Time (no allowance for cane shortage)	98.66	84.49	94.46	94.70	88.67	93.45	91.60	93.60	92.30	93.17	92.65	97.07	90.50	96.66	92.13	92.84	95.94	**93.24**
Tons of 2,000 lbs. of Cane per hour Actual Crushing	129.09	76.11	59.92	125.68	94.77	52.23	25.00	73.39	88.09	97.60	70.00	42.81	24.75	32.58	29.28	36.25	48.27	**81.48**
Tons of 2,000 lbs. White Sugar made	32,984	118	13,338	—	—	—	—	—	14,596	—	—	2,744	—	—	4,685	—	6,517	**74,982**
Tons of 2,000 lbs. Raw Sugar made	23,364	30,933	11,593	60,803	41,102	22,271	10,818	39,725	21,607	48,420	34,440	13,863	10,368	17,902	6,519	18,455	14,710	**429,894**
Sucrose per cent. Cane	13.73	12.20	13.79	13.48	13.93	13.62	13.71	13.74	14.06	13.60	13.65	13.93	13.90	13.56	13.50	13.79	14.41	**13.64**
Fibre per cent. Cane	14.47	15.10	14.38	14.26	14.33	14.07	14.73	13.76	14.88	14.39	14.44	15.53	14.32	14.04	15.90	14.80	15.01	**14.51**
Java Ratio	79.58	75.48	78.29	79.43	80.13	80.02	78.36	79.03	79.20	78.08	78.92	78.04	80.11	79.62	77.54	79.43	79.09	**78.87**
Milling Loss	4.96	8.64	8.61	6.46	6.77	9.30	6.97	6.53	9.62	9.42	6.47	8.30	8.19	7.67	10.11	5.57	10.07	**7.59**
Extraction Ratio	0.36	0.71	0.62	0.48	0.49	0.68	0.53	0.48	0.68	0.69	0.47	0.59	0.59	0.57	0.75	0.40	0.70	**0.56**
Primary Juice Loss	30.80	60.13	53.47	41.01	41.73	58.69	44.86	40.99	58.23	59.25	40.59	50.26	50.44	48.58	63.00	34.48	59.40	**47.73**
Imbibition per cent. Cane	40.17	23.71	36.17	30.22	28.83	41.74	27.20	32.32	32.11	30.95	29.50	29.64	33.04	36.50	22.58	26.27	28.94	**31.70**
Extraction (Sucrose in Mixed Juice % Sucrose in Cane)	94.79	89.31	91.02	93.18	93.02	90.39	92.25	93.46	89.82	90.04	93.15	90.76	91.57	92.06	88.09	94.01	89.51	**91.90**
Reduced Extraction (based on Fibre of 12.5 per cent.)	95.60	91.41	92.36	94.14	94.10	91.62	93.59	94.14	91.68	91.53	94.20	92.82	92.79	93.06	91.00	95.07	91.51	**93.18**
Sucrose per cent. Bagasse	2.19	3.57	3.69	2.94	2.91	3.79	3.39	2.81	4.31	3.96	2.72	3.80	3.88	3.32	4.38	2.58	4.31	**3.30**
Moisture per cent. Bagasse	52.87	54.17	52.20	50.75	53.24	54.31	48.62	53.10	49.86	52.85	54.39	49.47	47.80	52.17	51.29	50.31	51.69	**52.17**
Sucrose per cent. Cane lost in manufacture	1.99	2.73	2.67	2.18	2.57	2.96	2.45	2.30	3.29	2.68	2.35	3.17	2.22	2.54	3.35	2.10	2.97	**2.55**
Overall Recovery (Sucrose in Sugar % Sucrose in Cane)	85.48	77.66	80.66	83.86	81.58	78.27	82.09	83.28	76.62	80.28	82.80	77.26	84.06	81.27	75.13	84.78	79.37	**81.31**
Reduced Overall Recovery (based on Fibre of 12.5% and Mixed Juice Purity of 85.0°)	85.33	79.55	79.73	83.67	81.01	78.72	81.20	83.20	76.81	80.24	82.63	76.66	83.34	80.30	74.30	84.33	79.20	**81.16**
Recovery on Mixed Juice (Sucrose in Sugar % Sucrose in Mixed Juice)	90.18	86.96	88.62	90.00	87.70	86.58	88.99	89.10	85.30	89.16	88.89	85.13	91.80	88.28	85.28	90.18	88.68	**88.48**
Reduced Boiling-House Recovery (based on Mixed Juice Purity of 85.0°)	89.26	87.03	86.32	88.88	86.09	85.92	86.76	88.38	83.78	87.67	87.72	82.59	89.82	86.29	81.65	88.70	86.55	**87.10**
Available Sucrose % Sucrose in Mixed Juice	87.31	86.43	88.46	88.37	88.56	86.23	88.90	86.99	87.51	88.09	87.63	88.40	89.18	88.50	88.94	—	—	**87.80**
Recovery Efficiency (Sucrose in Sugar % Available Sucrose in Mixed Juice)	103.29	100.61	100.18	101.84	99.03	100.40	100.10	102.43	97.48	101.21	101.44	96.30	102.94	99.75	95.88	—	—	**100.68**
Sucrose in Bagasse per cent. Sucrose in Cane (A)	5.21	10.69	8.98	6.82	6.98	9.60	7.75	6.54	10.18	9.96	6.85	9.24	8.43	7.94	11.92	5.99	10.49	**8.10**
Sucrose in Filter Cake per cent. Sucrose in Cane (B)	0.48	2.11	0.21	0.34	1.18	1.52	1.25	0.88	—	1.06	—	1.33	0.74	2.06	—	1.31	0.44	**0.91**
Sucrose in Molasses per cent. Sucrose in Cane (C)	7.30	7.93	7.19	—	7.94	9.33	6.38	—	—	7.92	—	8.81	5.73	7.13	8.60	—	7.66	—
Undetermined Sucrose per cent. Sucrose in Cane (D)	1.10*	1.43*	2.96	8.98	2.32	1.28	2.53	9.30	13.20	0.35*	10.35	3.36	1.04	1.60	4.37	7.92	2.04	**9.68**
Sucrose lost in Boiling House per cent. Sucrose in Cane (B)+(C)+(D)	9.31	11.65	10.36	9.32	11.44	12.13	10.16	10.18	13.20	9.76	10.35	13.50	7.51	10.79	12.97	9.23	10.14	**10.59**
Sucrose in total Losses per cent. Sucrose in Cane (A)+(B)+(C)+(D)	14.52	22.34	19.34	16.14	18.42	21.73	17.91	16.72	23.38	19.72	17.20	22.74	15.94	18.73	24.89	15.22	20.63	**18.69**
FIRST EXPRESSED JUICE—																		
Brix	19.58	18.58	19.75	19.28	19.73	19.63	19.47	19.71	20.16	19.52	19.49	20.16	19.39	19.30	19.48	19.60	20.46	**19.17**
Purity (apparent)	88.15	86.98	89.20	88.00	88.10	86.71	89.80	88.20	88.06	89.27	88.70	89.60	89.50	88.27	89.40	88.50	89.05	**88.37**
LAST EXPRESSED JUICE—																		
Brix	1.96	4.83	2.68	2.63	4.31	4.21	4.20	2.59	4.69	5.26	3.27	5.67	5.23	1.90	4.71	2.40	5.28	**3.68**
Purity (apparent)	74.38	78.05	73.90	77.60	76.60	76.49	80.00	72.20	80.22	77.28	75.60	81.00	80.79	75.28	81.50	77.10	78.98	**76.86**
Purity drop from First Expressed Juice	13.77	8.93	15.30	10.40	11.50	10.22	9.80	16.00	7.84	11.99	13.10	8.60	8.71	12.99	7.90	11.40	10.07	**11.51**

FACTORY NUMBER	1	2	4	5	6	8	9	10	11	12	14	15	16	18	19	20	21	SEASON
MIXED JUICE—																		
Brix	14.06	14.72	14.03	14.72	15.68	13.41	15.12	14.92	14.82	14.62	15.50	15.20	14.14	13.80	15.80	15.80	15.78	**14.78**
Purity (Clerget)	86.11	84.93	87.20	86.30	86.50	85.60	87.20†	85.80	86.21	86.57	86.23	86.90†	87.55	86.89	87.60	86.70†	87.07	**86.36**
Reducing Sugar Ratio	2.61	3.24	2.51	3.15	2.68	3.21	—	3.56	3.27	3.39	3.18	2.40	2.17	3.24	3.60	2.68	4.04	**3.08**
Purity drop from First Expressed Juice	2.04	2.05	2.00	1.70	1.60	1.11	2.60	2.40	1.85	2.70	2.47	2.70	1.95	1.38	1.80	1.80	1.98	**2.01**
CLARIFIED JUICE—																		
Brix	12.01	14.66	15.20	14.87	15.00	12.86	13.50	12.89	13.76	13.89	13.91‡	14.69	12.77	13.53	16.33	15.80	13.95	**13.99**
Purity (apparent)	91.38	87.18	88.10	87.30	87.50	86.36	88.00	87.60	87.22	88.20	88.52	87.70	88.40	87.51	88.40	88.30	88.60	**88.12**
Reducing Sugar Ratio	1.15	2.61	—	—	2.39	2.87	—	2.74	—	2.40	2.79	2.14	2.13	—	2.61	2.44	2.91	**2.34**
pH	6.92	7.36	7.17	7.70	7.41	—	—	7.50	7.24	7.30	7.31	—	7.40	—	—	—	7.10	**7.32**
Ash per cent. Brix	2.37	3.92	—	—	—	—	—	—	—	3.57	3.33	—	—	—	—	—	—	—
FILTER CAKE—																		
Per cent. Sucrose	0.60	6.84	0.61	1.06	5.20	3.59	4.27	3.45	3.12	3.59	3.23	4.98	2.89	2.78	4.38	4.40	2.10	**2.63**
Weight per cent. Cane	10.91	3.76	4.75	4.29	3.15	5.78	4.01	3.50	—	4.02	—	3.72	3.54	—	—	4.10	3.04	**4.74**
SYRUP—																		
Brix	53.30	52.84	57.81	55.11	51.59	54.12	52.80	55.71	51.38	51.48	52.89‡	51.22	49.74	56.22	54.95	54.10	52.32	**53.21**
Purity (apparent)	91.50	87.15	88.30	88.30	86.80	86.44	88.00	87.50	87.48	88.50	88.59	87.30	88.80	86.67	88.40	88.30	88.63	**88.22**
Reducing Sugar Ratio	1.27	2.43	2.61	2.52	2.56	2.66	—	2.56	3.08	2.38	2.25	2.18	1.77	—	2.55	2.24	2.74	**2.36**
pH	6.88	7.28	7.02	7.60	7.07	—	—	7.30	7.11	7.20	7.30	—	7.40	—	—	—	6.99	**7.20**
Purity drop from First Expressed Juice	−3.35	−0.17	0.90	−0.30	1.30	0.27	1.80	0.70	0.58	0.77	0.11	2.30	0.70	1.60	1.00	0.20	0.42	**0.15**
Purity increase from Mixed Juice	5.39	2.22	1.10	2.00	0.30	0.84	0.80	1.70	1.27	1.93	2.36	0.40	1.25	−0.22	0.80	1.60	1.56	**1.86**
FIRST MASSECUITE—																		
Brix	92.06	93.11	92.57	92.87	93.08	91.91	91.70	94.00	93.88	92.99	91.30‡	92.76	91.37	90.38	91.09	92.70	93.17	**92.64**
Purity (apparent)	90.97	77.49	85.60	84.40	80.50	84.41	85.70	82.00	86.32	82.70	83.90	77.00	88.48	83.86	87.30	82.40	85.60	**84.03**
Purity of Run-off	76.05	56.30	65.60	67.40	57.70	64.32	66.50	59.40	66.00	57.40	66.30	58.40	66.91	65.83	69.30	61.80	65.03	**64.17**
Cubic feet per ton of Sugar (all Massecuites)	48.25	55.64	51.44	—	49.31	—	46.53	49.53	—	47.51	—	—	44.96	—	—	—	—	**49.44**
SECOND MASSECUITE—																		
Brix	95.94	93.58	96.82	95.85	96.43	92.78	94.00	96.38	95.59	96.19	91.70‡	95.07	98.01	94.35	94.28	96.80	95.54	**95.34**
Purity (apparent)	80.83	66.48	70.00	68.00	70.10	71.97	73.30	66.60	73.85	66.80	76.20	64.10	68.85	70.43	70.40	67.20	73.88	**70.80**
Purity of Run-off	57.05	42.82	43.40	45.00	47.40	51.74	48.00	42.00	48.30	45.80	56.50	46.70	40.64	55.05	48.90	40.20	50.21	**48.00**
THIRD MASSECUITE—																		
Brix	97.91	—	96.80	—	97.75	—	95.90	—	97.05	—	91.70‡	—	99.03	—	—	—	96.08	**96.52**
Purity (apparent)	68.07	—	58.00	—	63.00	—	57.90	—	63.43	—	67.40	—	56.00	—	—	—	66.63	**64.19**
Purity of Run-off	46.73	—	37.20	—	42.60	—	37.60	—	40.80	—	48.40	—	36.22	—	—	—	44.87	**43.28**
JELLY—																		
Brix	—	—	—	93.96	97.12	92.85	—	96.45	94.34	93.38	84.20‡	92.88	—	91.47	92.69	95.20	—	**94.35**
Purity (apparent)	—	—	52.70	45.60	45.10	51.99	—	42.50	44.58	46.30	50.10	45.00	—	51.87	49.00	42.40	—	**46.72**
FINAL MOLASSES—																		
Brix	85.30	89.81	87.25	88.96	90.12	89.23	85.00	90.60	88.56	88.27	79.57‡	88.26	91.75	—	84.81	—	82.46	**87.52**
Purity (Clerget)	47.52	42.82†	39.40	42.30	42.30	46.56	38.06†	40.00	40.63	43.70	47.45	42.90†	36.22	45.15	43.50†	40.20†	44.87†	**43.12**
Weight per cent. Cane at 85.0° Brix	2.47	2.66	3.00	—	2.97	3.20	2.70	—	—	2.90	—	3.36	2.59	3.57	3.14	—	2.91	**2.89**
POLARISATION OF SUGARS—																		
White	99.90	99.50	99.60	—	—	—	—	—	99.70	—	—	99.64	—	99.80	99.68	—	99.76	**99.77**
Raw	97.76	97.83	97.80	98.72	98.36	96.00	—	99.05	98.81	98.52	98.62	98.87	98.57	98.74	97.51	98.55	98.69	**98.37**
Average of all Sugars	98.95	97.84	99.01	98.72	98.36	96.00	98.73	99.05	99.17	98.52	98.62	99.00	98.57	98.75	98.47	98.55	99.02	**98.60**
SO_2 in parts per million	20.00	34.70	56.30	81.00	58.60	—	54.00	54.00	45.13	76.00	64.00	—	83.80	—	—	58.00	71.18	**56.52**

† Apparent purity. * Other losses reported. ‡ Brix and purity by refractometer.

COMPARATIVE RESULTS FOR RECENT YEARS.

COUNTRY	QUEENSLAND.[1]		FORMOSA.[2]		MAURITIUS.[3]		LOUISIANA.[4]	PUERTO RICO.[5]
YEAR	1936.	1937.	1936.	1937.	1936.	1937.	1937.	1937-38.
CANE—								
Per cent. Sucrose	15.66	16.15	14.20	13.19	13.71	12.98	9.84	13.31
Per cent. Fibre	11.63	11.17	11.77	12.18	12.60	12.60	14.01	13.51
JUICES—								
Purity of First Crusher	89.36	89.61	87.28	87.10	87.80	87.20	78.24	85.83
Purity of Mixed Juice	—	—	86.79	84.19	85.00	84.50	76.78	82.85
Purity of last Roller Juice	79.11	79.33	72.55	72.79	74.60	73.20	—	—
Purity of Syrup	89.27	89.41	86.36	85.25	85.60	85.00	—	84.23
Drop in purity Crusher to Mixed Juice	—	—	0.49	2.91	2.80	2.70	1.46	2.98
Drop in purity Crusher to last Roller	10.25	10.28	14.73	14.31	13.20	14.00	—	—
Drop in purity Crusher to Syrup	0.09	0.20	0.92	1.85	2.20	2.20	—	1.60
Increase in purity Mixed Juice to Syrup	—	—	−0.43	1.06	0.60	0.50	—	1.38
Reducing Sugar Ratio of Mixed Juice	—	—	4.72	6.12	3.90	4.40	—	—
JAVA RATIO	83.37	83.83	83.91	83.44	80.08	80.50	78.69	78.88
BAGASSE—								
Per cent. Sucrose	3.07	3.13	1.50	1.42	2.76	2.59	2.23	2.66
Per cent. Moisture	49.51	49.20	38.12	38.88	44.60	44.50	46.38	47.36
EXTRACTION—								
Imbibition % Cane	—	—	27.71	25.85	25.90	25.00	19.53	25.00
Sucrose in Mixed Juice % Sucrose in Cane	95.01	95.22	97.92	96.86	95.10	95.10	93.70	94.43
Reduced Extraction (based on 12.5% Fibre)	94.58	94.57	97.77	96.77	95.10	95.10	94.48	94.91
Primary Juice loss	37.92	38.01	15.59	22.64	33.99	33.99	38.67	35.66
FILTER CAKE—								
Per cent. Sucrose	—	—	2.16	1.92	7.70	7.60	3.67	2.88
Weight % Cane	—	—	1.57	1.71	1.60	1.51	2.46	2.08
FINAL MOLASSES—								
Purity	35.54	36.62	30.00	28.74	40.30	38.60	—	30.62
RECOVERY—								
Sucrose % Cane lost in manufacture	1.89	1.97	1.19	1.18	2.11	2.05	1.75	1.72
Sucrose in Sugar % Sucrose in Cane	87.90	87.79	91.59	91.09	84.60	84.30	82.24	87.12
Reduced Overall Recovery (12.5% Fibre, 85° pur. Mixed Juice)	—	—	90.44	91.36	84.60	84.50	87.74	88.66
Sucrose in Sugar % Sucrose in Mixed Juice	92.52	92.20	93.53	94.04	88.90	88.50	87.77	92.26
Reduced Boiling House Recovery (based on 85° pur. Mxd. Juice)	—	—	92.50	94.40	88.90	88.90	92.87	93.40
YIELD—								
Tons Cane per ton Sugar	7.17	6.96	7.68	8.05	8.50	9.00	—	8.25
Tons Cane per ton Sugar of 96° Pol.	6.98	6.77	7.59	7.99	8.28	8.76	11.86	8.17
LOSSES—								
Sucrose in Bagasse % Sucrose in Cane (A)	4.99	4.78	2.03	2.07	4.90	4.90	6.30	5.57
Sucrose in Filter Cake % Sucrose in Cane (B)	0.47	0.52	0.25	0.23	0.90	0.88	0.90	0.45
Sucrose in Molasses % Sucrose in Cane (C)	5.04	5.10	5.47	5.92	—	—	9.68	6.50
Undetermined Sucrose % Sucrose in Cane (D)	1.60	1.81	0.62	0.41	9.60	9.92	0.87	0.63
Sucrose lost in Boiling House % Sucrose in Cane (B)+(C)+(D)	7.11	7.43	6.34	6.56	10.50	10.82	11.45	7.31
Sucrose in Total Losses % Sucrose in Cane (A)+(B)+(C)+(D)	12.10	12.21	8.41	8.80	15.40	15.70	17.75	12.88
SUGAR—								
Average Polarization of all Sugars	98.67	98.67	97.11	96.73	98.60	98.60	—	96.96

[1] From the Annual Reports of the Bureau of Sugar Experiment Stations, Queensland. [2] From Association of Sugar Technologists, Formosa, 23rd Annual Statement.
[3] Compiled by the Sugar Technology Service of the Dept. of Agriculture, Mauritius. [4] From "The Sugar Bulletin," New Orleans (three most efficient factories only).
[5] Mill data report for 1937-38, Association of Sugar Producers of Puerto Rico (arithmetical averages of figures shewn).

COMPARATIVE RESULTS FOR RECENT YEARS.

COUNTRY	NATAL										
YEAR	1928.	1929.	1930.	1931.	1932.	1933.	1934.	1935.	1936.	1937.	1938.
CANE—											
Per cent. Sucrose	13.75	12.95	13.66	13.84	13.48	13.88	11.88	13.65	13.30	13.92	13.64
Per cent. Fibre	15.88	15.52	15.82	15.75	15.65	15.78	15.24	15.92	15.01	15.14	14.51
JUICES—											
Purity of First Crusher	87.80	88.81	88.66	87.92	87.89	87.46	86.03	89.35	88.18	88.15	88.37
Purity of Mixed Juice	84.90	86.04	85.88	85.27	85.30	84.92	84.02	86.49	85.43	85.60	86.36
Purity of last Roller Juice	78.50	80.72	80.79	79.99	79.20	78.26	76.71	78.05	76.87	76.81	76.86
Purity of Syrup	86.60	87.44	87.60	86.82	86.84	86.57	85.53	88.28	87.53	87.70	88.22
Drop in purity Crusher to Mixed Juice..	2.90	2.77	2.78	2.65	2.59	2.54	2.01	2.86	2.75	2.55	2.01
Drop in purity Crusher to last Roller	9.30	8.09	7.87	7.93	8.69	9.20	9.32	11.30	11.31	11.34	11.51
Drop in purity Crusher to Syrup	1.20	1.37	1.06	1.10	1.05	0.89	0.50	1.07	0.65	0.45	0.15
Increase in purity Mixed Juice to Syrup	1.70	1.40	1.72	1.55	1.54	1.65	1.51	1.79	2.10	2.10	1.86
Reducing Sugar Ratio of Mixed Juice	3.86	3.35	3.33	3.35	3.09	4.01	4.21	2.65	3.04	3.23	3.08
JAVA RATIO	76.78	77.01	76.36	76.92	76.99	77.27	78.66	76.24	77.44	77.43	78.87
BAGASSE—											
Per cent. Sucrose	4.10	4.07	4.20	4.22	3.83	3.71	3.05	3.48	3.40	3.40	3.30
Per cent. Moisture	50.01	50.69	50.66	50.09	51.89	51.62	52.11	51.93	52.76	52.01	52.17
EXTRACTION—											
Imbibition % Cane..	26.34	25.54	26.62	27.86	29.66	30.45	30.25	33.04	32.40	31.84	31.70
Sucrose in Mixed Juice % Sucrose in Cane	89.47	89.02	89.78	89.40	89.86	90.28	91.07	90.64	91.08	91.53	91.90
Reduced Extraction (based on 12.5% Fibre)	92.03	91.46	92.23	91.90	92.19	92.59	92.90	92.94	92.78	93.22	93.18
Primary Juice loss	55.78	59.77	54.38	56.70	54.65	51.88	49.67	49.43	50.71	47.47	52.17
FILTER CAKE—											
Per cent. Sucrose	5.15	6.15	4.97	4.79	4.50	4.04	3.65	3.69	3.20	3.37	2.63
Weight % Cane	4.77	4.33	4.97	5.01	5.41	5.18	5.07	5.01	4.71	4.75	4.74
FINAL MOLASSES—											
Purity	45.30	45.11	45.90	45.04	45.06	44.92	42.58	46.00	43.89	43.69	43.12
RECOVERY—											
Sucrose % Cane lost in manufacture	3.43	3.38	3.58	3.53	3.36	3.27	2.52	2.94	2.71	2.73	2.55
Sucrose in Sugar % Sucrose in Cane	75.06	75.13	74.77	74.39	75.73	76.63	77.59	78.40	79.64	80.41	81.31
Reduced Overall Recovery (12.5% Fibre, 85° pur. Mixed Juice)	77.36	75.93	76.19	76.18	77.34	78.67	80.14	78.76	80.73	81.33	81.16
Sucrose in Sugar % Sucrose in Mixed Juice	83.90	84.39	83.80	83.27	84.27	84.88	85.20	86.52	87.44	87.85	88.48
Reduced Boiling House Recovery (based on 85° pur. Mxd. Juice)	84.06	83.02	82.61	82.90	83.89	84.97	86.27	84.74	87.01	87.25	87.10
YIELD—											
Tons Cane per ton Sugar	9.49	10.06	9.59	9.53	9.61	9.28	10.67	9.19	9.29	8.80	8.89
Tons Cane per ton Sugar of 96° Pol.	9.30	9.87	9.40	9.33	9.40	9.03	10.40	8.96	9.06	8.58	8.66
LOSSES—											
Sucrose in Bagasse % Sucrose in Cane (A)	10.53	10.99	11.08	10.86	10.14	9.72	8.93	9.36	8.92	8.47	8.10
Sucrose in Filter Cake % Sucrose in Cane (B)..	—	—	—	—	—	—	—	1.37	1.14	1.15	0.91
Sucrose in Molasses % Sucrose in Cane (C)	—	—	—	—	—	—	—	—	—	—	—
Undetermined Sucrose % Sucrose in Cane (D)..	—	—	—	—	—	—	—	10.87	10.30	9.97	9.68
Sucrose lost in Boiling House % Sucrose in Cane (B)+(C)+(D)	14.41	13.88	14.15	14.56	14.13	13.65	13.48	12.24	11.44	11.12	10.59
Sucrose in Total Losses % Sucrose in Cane (A)+(B)+(C)+(D)	24.94	24.87	25.23	25.42	24.27	23.37	22.41	21.60	20.36	19.59	18.69
SUGAR—											
Average Polarization of all Sugars	98.00	97.87	97.96	98.08	98.14	98.68	98.45	98.42	98.43	98.50	98.60

Average Manufacturing Results by periods for Natal Sugar Factories Reporting to the Experiment Station, Season 1938-39.

Period ending		MAY 28 1938.	JULY 2 1938.	JULY 30 1938.	SEPT. 3 1938.	OCT. 1 1938.	OCT. 29 1938.	DEC. 3 1938.	DEC. 31 1938.	SEASON
Tons of 2,000 lbs. Cane crushed	This period	107,805	714,479	589,766	767,408	616,726	598,412	723,466	212,177	
	To date		832,668	1,422,433	2,189,840	2,806,547	3,404,960	4,149,282	4,406,530	**4,488,068** short tons. *4,071,575 metric tons.*
Tons of 2,000 lbs. Sugar bagged and estimated	This period	10,242	71,445	64,212	89,123	74,035	72,089	85,440	22,418	
	To date		82,520	146,733	235,856	309,892	381,990	469,664	497,247	**504,876** short tons. *458,024 metric tons.*
Tons Cane per ton Sugar	This period	10.54	10.00	9.18	8.61	8.33	8.30	8.47	9.46	
	To date		10.09	9.69	9.28	9.06	8.91	8.83	8.86	**8.89**
Tons Cane per ton of Sugar, calculated as sugar of 96° Pol	This period	10.26	9.74	8.94	8.38	8.11	8.08	8.25	9.23	
	To date		9.82	9.43	9.03	8.82	8.67	8.60	8.63	**8.66**
Sucrose per cent. Cane	This period	11.89	12.45	13.18	13.92	14.45	14.47	14.18	13.15	
	To date		12.37	12.70	13.13	13.42	13.60	13.70	13.67	**13.64**
Fibre per cent. Cane	This period	14.67	14.73	14.22	14.17	14.37	14.39	14.70	14.92	
	To date		14.73	14.52	14.40	14.39	14.39	14.46	14.48	**14.51**
Java Ratio	This period	80.40	79.97	79.80	79.22	78.63	78.70	78.07	76.82	
	To date		80.02	79.94	79.70	79.46	79.32	79.08	78.97	**78.87**
Sucrose per cent. Bagasse	This period	2.76	3.20	3.29	3.37	3.44	3.40	3.31	3.31	
	To date		3.15	3.21	3.26	3.30	3.32	3.32	3.32	**3.30**
Moisture per cent. Bagasse	This period	53.20	52.78	52.38	52.11	51.89	51.69	51.78	52.57	
	To date		52.82	52.64	52.46	52.34	52.23	52.15	52.16	**52.17**
Imbibition per cent. Cane	This period	30.35	32.78	31.43	31.43	31.28	31.84	32.33	31.64	
	To date		32.50	32.06	31.84	31.72	31.74	31.81	31.79	**31.70**
Extraction	This period	92.09	91.22	91.81	92.13	92.17	92.29	92.18	91.28	
	To date		91.28	91.51	91.74	91.84	91.92	91.95	91.93	**91.90**
Recovery on Mixed Juice	This period	85.44	86.79	88.76	89.36	88.94	88.97	89.05	86.64	
	To date		86.56	87.51	88.20	88.38	88.49	88.60	88.51	**88.48**
Overall Recovery	This period	78.68	79.17	81.49	82.33	81.98	82.11	82.09	79.08	
	To date		79.01	80.08	80.91	81.17	81.34	81.47	81.37	**81.16**
Purity of Mixed Juice	This period	82.96	84.44	85.99	87.03	87.08	87.05	87.05	85.88	
	To date		84.23	84.98	85.74	86.06	86.25	86.39	83.68	**86.36**
Reducing Sugar Ratio	This period	4.45	4.20	3.15	2.63	2.61	2.57	2.79	3.61	
	To date		4.26	3.76	3.35	3.18	3.06	3.03	3.04	**3.30**
Purity of Syrup	This period	84.77	86.42	87.94	88.93	88.99	89.05	88.93	87.21	
	To date		86.16	86.93	87.61	87.96	88.17	88.31	88.25	**88.22**
Sucrose in Filter Cake	This period	3.12	3.05	3.36	3.47	3.74	3.70	3.51	3.39	
	To date		3.07	3.19	3.30	3.40	3.46	3.46	3.45	**2.63**A
Purity of Final Molasses	This period	—	42.48	42.48	43.12	43.03	43.48	43.70	43.61	
	To date		42.41	42.20	42.56	42.57	42.89	42.90	43.14	**43.12**
Average Polarization of Sugar	This period	98.64	98.59	98.62	98.65	98.64	98.63	98.56	98.38	
	To date		98.60	98.60	98.62	98.63	98.63	98.61	98.60	**98.60**
SO_2 in Sugar p.p.m...	This period	57.99	55.05	58.84	55.83	56.01	54.48	54.63	60.32	
	To date		55.59	57.10	56.56	56.49	55.96	55.37	55.92	**56.52**

A.—Weighted average. Monthly and to date figures are arithmetic averages.

AREA OF CANE HARVESTED AND YIELDS BY DISTRICTS (EUROPEAN PLANTERS ONLY)

Compiled from Union Department of Census Returns

DISTRICT.	ACREAGE HARVESTED.									
	1928.	**1929.**	**1930.**	**1931.**	**1932.**	**1933.**	**1934.**	**1935.**	**1936.**	**1937.**
PORT SHEPSTONE	2,705	3,109	3,697	3,212	4,182	3,128	4,158	4,010	4,197	3,484
UMZINTO	24,351	24,848	20,153	23,443	28,716	27,595	29,536	30,403	30,984	30,885
DURBAN AND PINETOWN	5,442	5,467	6,158	5,979	7,312	6,004	7,933	6,798	7,420	6,078
Total South of Umgeni River	32,498	33,424	30,008	32,634	40,210	36,727	41,627	41,211	42,601	40,447
Ratio to 1926 (= 100)	134.4	138.3	124.1	135.0	166.3	151.9	172.2	170.5	176.2	167.3
INANDA	19,060	20,280	18,831	19,608	22,635	22,126	23,892	25,145	24,278	23,494
LOWER TUGELA	32,616	32,890	39,492	35,608	41,066	42,634	46,848	49,616	52,404	49,700
Total for North Coast between Umgeni and Tugela Rivers	51,676	53,170	58,323	55,216	63,701	64,760	70,740	74,761	76,682	73,194
Ratio to 1926 (= 100)	116.1	119.5	131.0	124.1	143.1	145.5	159.0	168.0	172.3	164.5
Total for Natal South of the Tugela (excluding Zululand)	84,174	86,594	88,331	87,850	103,911	101,487	112,367	115,972	119,283	113,641
Ratio to 1926 (= 100)	122.6	126.1	128.6	127.9	151.3	147.8	163.6	168.9	173.7	165.5
MTUNZINI	17,008	16,915	19,269	18,352	20,523	19,201	21,211	21,505	21,958	20,751
ESHOWE	4,036	3,602	7,232	5,787	6,343	6,875	7,249	7,269	7,007	7,300
LOWER UMFOLOZI	21,083	24,034	24,373	23,696	28,208	29,360	27,301	27,173	26,746	24,770
HLABISA	3,483	3,712	5,669	4,089	4,599	4,654	4,319	3,973	3,994	5,373
Total North of the Tugela (Zululand)	45,612	48,263	56,543	51,864	59,673	60,090	60,080	59,920	59,705	58,194
Ratio to 1926 (= 100)	119.6	126.6	148.3	136.0	156.5	157.6	157.6	157.2	156.6	152.6
GRAND TOTAL FOR NATAL (including Zululand)	129,786	134,857	144,874	139,774	163,584	161,577	172,447	175,892	178,988	171,835
Ratio to 1926 (= 100)	121.5	126.3	135.6	130.9	153.2	151.3	161.5	164.7	167.6	160.9

AREA OF CANE HARVESTED AND YIELDS BY DISTRICTS (EUROPEAN PLANTERS ONLY)

Compiled from Union Department of Census Returns

DISTRICT.	PER CENT. OF TOTAL AREA									
	1928.	**1929.**	**1930.**	**1931.**	**1932.**	**1933.**	**1934.**	**1935.**	**1936.**	**1937.**
PORT SHEPSTONE...	2.1	2.3	2.6	2.3	2.6	1.9	2.4	2.3	2.3	2.0
UMZINTO	18.8	18.4	13.9	16.8	17.6	17.1	17.1	17.3	17.3	18.0
DURBAN AND PINETOWN	4.2	4.1	4.2	4.3	4.5	3.7	4.6	3.9	4.2	3.5
Total South of Umgeni River	25.1	24.8	20.7	23.4	24.6	22.7	24.1	23.5	23.8	23.5
INANDA	14.7	15.0	13.0	14.0	13.8	13.7	13.8	14.3	13.6	13.7
LOWER TUGELA	25.1	24.4	27.3	25.5	25.1	26.4	27.2	28.2	29.3	28.9
Total for North Coast between Umgeni and Tugela Rivers	39.8	39.4	40.3	39.5	38.9	40.1	41.0	42.5	42.8	42.6
Total for Natal South of the Tugela (excluding Zululand)	64.9	64.2	61.0	62.9	63.5	62.8	65.1	66.0	66.6	66.1
MTUNZINI	13.1	12.5	13.3	13.1	12.5	11.9	12.3	12.2	12.3	12.1
ESHOWE	3.1	2.7	5.0	4.1	3.9	4.2	4.2	4.1	3.9	4.3
LOWER UMPOLOZI	16.2	17.8	16.8	17.0	17.2	18.2	15.8	15.4	15.0	14.4
HLABISA	2.7	2.8	3.9	2.9	2.8	2.9	2.6	2.3	2.2	3.1
Total North of the Tugela (Zululand) .	35.1	35.8	39.0	37.1	36.5	37.2	34.9	34.0	33.4	33.9
GRAND TOTAL FOR NATAL (including Zululand)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

AREA OF CANE HARVESTED AND YIELDS BY DISTRICTS (EUROPEAN PLANTERS ONLY).—(Continued.

COMPILED FROM UNION DEPARTMENT OF CENSUS RETURNS.

DISTRICT.	YIELD OF CANE IN TONS.										
	1927.	1928.	1929.	1930.	1931.	1932.	1933.	1934.	1935.	1936.	1937.
Port Shepstone	34,891	48,662	54,068	68,770	60,231	81,823	64,018	67,974	59,259	56,685	75,028
Umzinto	319,105	470,723	498,795	449,410	486,803	638,701	598,308	611,231	553,401	564,427	692,159
Durban and Pinetown	102,218	123,231	135,604	164,849	136,979	159,020	138,096	185,118	137,805	146,676	124,109
Total South of Umgeni River	456,214	642,616	688,467	683,029	684,013	879,544	800,422	864,323	750,465	767,788	891,296
Ratio to 1926 (= 100)	102.3	144.1	154.4	153.2	153.4	197.3	179.54	193.9	168.3	172.2	199.9
Inanda	340,501	351,677	415,176	414,466	375,763	455,816	504,540	618,853	672,954	629,945	615,227
Lower Tugela	468,315	654,828	684,601	873,467	648,693	754,022	829,067	1,012,784	1,033,633	1,184,839	1,138,342
Total for North Coast between Umgeni and Tugela Rivers	808,816	1,006,505	1,099,777	1,287,933	1,024,456	1,209,838	1,333,607	1,631,637	1,706,587	1,814,784	1,753,569
Ratio to 1926 (= 100)	97.6	121.5	132.8	155.5	123.7	146.1	161.00	197.0	206.1	219.1	211.7
Total for Natal South of the Tugela (excluding Zululand)	1,265,030	1,649,121	1,788,244	1,970,962	1,708,469	2,089,382	2,134,029	2,495,960	2,457,052	2,582,572	2,644,865
Ratio to 1926 (= 100)	99.3	129.4	139.3	154.7	134.1	164.0	167.51	195.9	192.9	202.7	207.6
Mtunzini	326,502	354,523	349,925	434,124	331,561	360,130	353,287	414,821	403,121	413,802	435,154
Eshowe	57,882	91,866	74,203	146,256	109,525	105,836	120,099	130,104	128,191	120,935	151,020
Lower Umfolozi	456,517	484,622	519,332	580,925	426,516	525,498	582,636	489,547	496,591	616,326	713,675
Hlabisa	51,470	64,768	66,184	110,840	59,657	74,379	80,552	63,866	50,529	74,276	136,249
Total North of the Tugela (Zululand)	892,371	995,779	1,009,644	1,272,145	927,259	1,065,813	1,136,574	1,098,338	1,078,432	1,225,339	1,436,098
Ratio to 1926 (= 100)	98.2	109.6	111.1	140.0	102.0	117.3	125.08	120.9	118.7	134.8	158.0
GRAND TOTAL FOR NATAL (including Zululand)	2,157,401	2,644,900	2,797,888	3,243,107	2,635,728	3,155,195	3,270,603	3,594,298	3,535,484	3,807,911	4,080,963
Ratio to 1926 (= 100)	98.8	121.1	128.2	148.6	120.8	144.6	149.85	164.7	162.0	174.5	187.0

AREA OF CANE HARVESTED AND YIELDS BY DISTRICTS (EUROPEAN PLANTERS ONLY).—(Continued).

COMPILED FROM UNION DEPARTMENT OF CENSUS RETURNS.

DISTRICT.	PER CENT. OF TOTAL TONNAGE.											
	1926.	**1927.**	**1928.**	**1929.**	**1930.**	**1931.**	**1932.**	**1933.**	**1934.**	**1935.**	**1936.**	**1937.**
Port Shepstone	1.7	1.6	1.8	1.9	2.1	2.3	2.6	2.0	1.9	1.7	1.5	1.8
Umzinto	14.1	14.8	17.8	17.8	13.9	18.5	20.2	18.3	17.0	15.6	14.8	17.0
Durban and Pinetown	4.6	4.7	4.7	4.8	5.1	5.2	5.0	4.2	5.1	3.9	3.9	3.0
Total South of Umgeni River	20.4	21.1	24.3	24.6	21.1	26.0	27.9	24.5	24.0	21.2	20.2	21.8
Inanda	15.1	15.8	13.3	14.8	12.8	14.3	14.4	15.4	17.2	19.0	16.5	15.1
Lower Tugela	22.8	21.7	24.8	24.5	26.9	24.6	23.9	25.3	28.2	29.2	31.1	27.9
Total for North Coast between Umgeni and Tugela Rivers	37.9	37.5	38.1	39.3	39.7	38.9	38.3	40.8	45.4	48.3	47.6	43.0
Total for Natal South of the Tugela (excluding Zululand)	58.3	58.6	62.4	63.9	60.8	64.8	66.2	65.2	69.4	69.5	67.8	64.8
Mtunzini	15.1	15.1	13.4	12.5	13.4	12.6	11.4	10.8	11.6	11.4	10.9	10.7
Eshowe	2.4	2.7	3.5	2.7	4.5	4.2	3.4	3.7	3.6	3.6	3.2	3.7
Lower Umfolozi	24.0	21.2	18.3	18.6	17.9	16.2	16.7	17.8	13.6	14.1	16.2	17.5
Hlabisa	—	2.4	2.5	2.4	3.4	2.3	2.4	2.5	1.8	1.4	1.9	3.3
Total North of the Tugela (Zululand)	41.6	41.4	37.6	36.1	39.2	35.2	33.8	34.8	30.6	30.5	32.2	35.2
GRAND TOTAL FOR NATAL (including Zululand)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

AREA OF CANE HARVESTED AND YIELDS BY DISTRICTS (EUROPEAN PLANTERS ONLY).—(Continued).

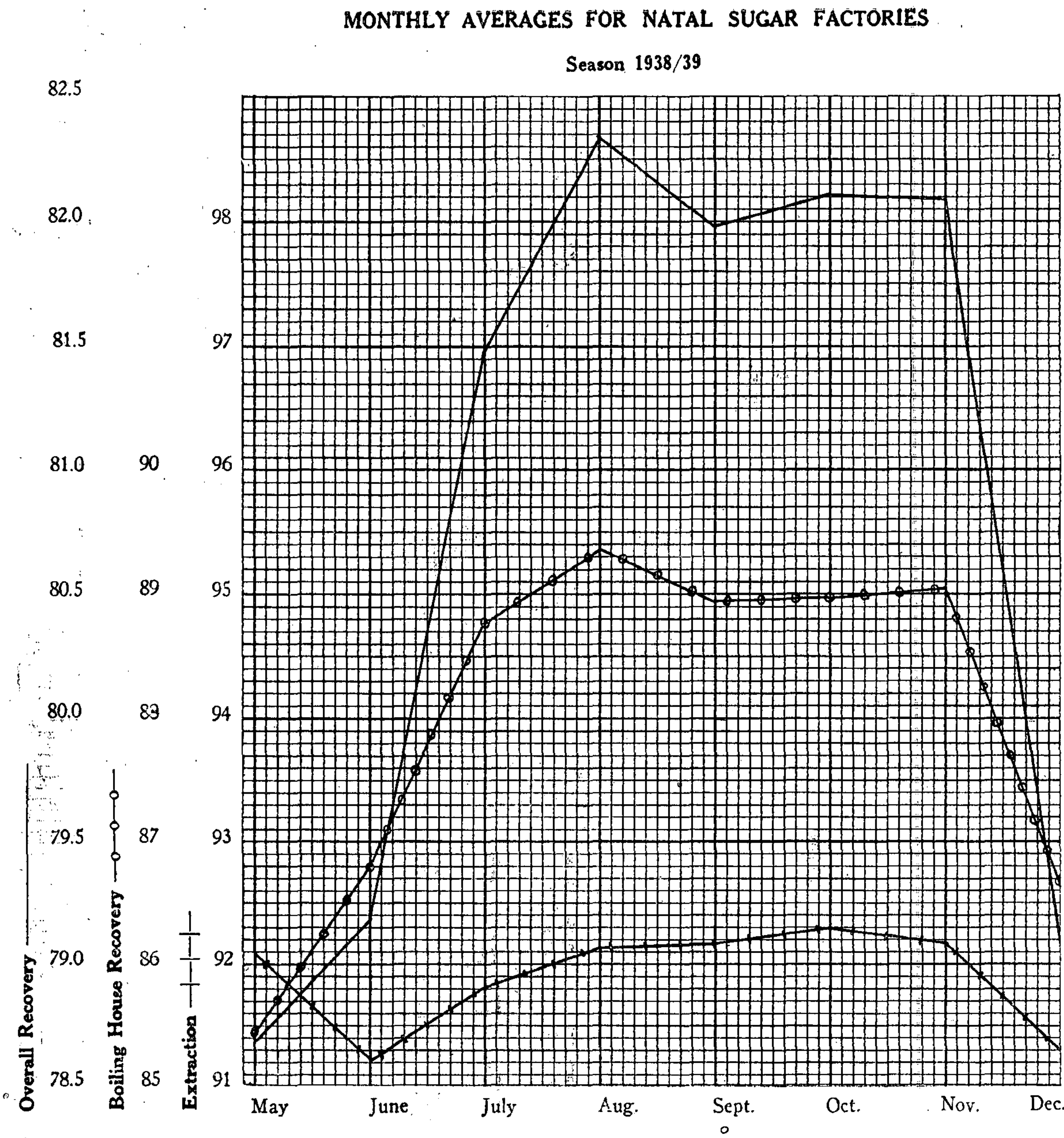
COMPILED FROM UNION DEPARTMENT OF CENSUS RETURNS.

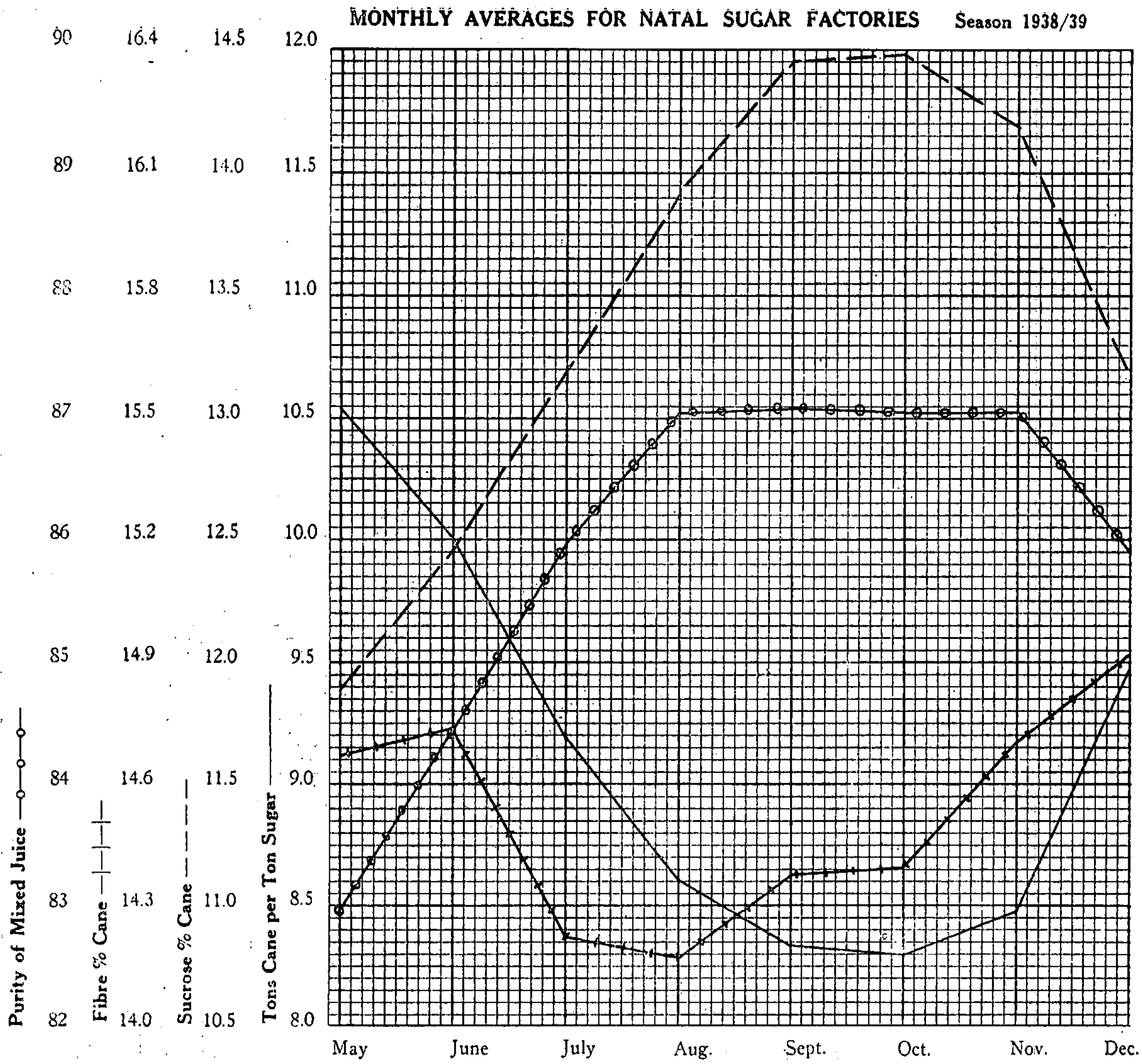
DISTRICT.	TONS CANE PER ACRE.											
	1926.	1927.	1928.	1929.	1930.	1931.	1932.	1933.	1934.	1935.	1936.	1937.
Port Shepstone	17.68	16.72	19.98	17.40	18.60	18.80	19.57	20.47	16.34	14.78	13.51	21.53
Umzinto	17.74	17.57	19.33	20.10	22.30	20.80	22.24	21.68	20.69	18.20	18.22	22.41
Durban and Pinetown	21.39	19.49	22.64	24.80	26.77	22.90	21.75	23.00	23.34	20.27	19.77	20.42
Total South of Umgeni River	18.44	17.89	19.77	20.60	22.76	21.00	21.87	21.79	20.76	18.21	18.02	22.04
Ratio to 1926 (= 100)	100.0	97.00	107.20	111.70	123.40	114.10	118.60	118.17	112.58	98.75	97.72	119.52
Inanda	16.72	16.79	18.45	20.50	22.01	19.20	20.14	22.80	25.90	26.76	25.95	26.19
Lower Tugela	20.10	19.02	20.08	20.80	22.12	18.20	18.36	19.45	21.62	20.83	22.61	22.90
Total for North Coast between Umgeni and Tugela Rivers	18.61	18.01	19.48	20.68	22.08	18.60	18.99	20.59	23.07	22.83	23.67	23.96
Ratio to 1926 (= 100)	100.00	96.80	104.70	111.10	118.10	100.00	102.00	110.64	123.97	122.68	127.19	128.75
Total for Natal South of the Tugela (excluding Zululand)	18.55	17.97	19.59	20.65	22.31	19.40	20.11	21.03	22.21	21.19	21.65	23.27
Ratio to 1926 (= 100)	100.00	96.90	105.60	111.30	120.30	104.60	108.40	113.37	119.73	114.23	116.71	125.44
Mtunzini	22.39	21.16	20.84	20.70	22.53	18.10	17.55	18.40	19.56	18.75	18.85	20.97
Eshowe	22.55	20.88	22.76	20.60	20.22	18.90	16.69	17.47	17.95	17.64	17.26	20.69
Lower Umfolozi	25.00	22.57	22.99	21.60	23.83	18.00	18.63	19.84	17.93	18.28	23.04	28.81
Hlabisa	—	16.93	18.58	17.80	19.55	14.60	16.17	17.31	14.79	12.72	18.60	25.36
Total North of the Tugela (Zululand) .	23.83	21.50	21.83	20.92	22.50	17.90	17.86	18.91	18.28	18.00	20.52	24.68
Ratio to 1926 (= 100)	100.00	90.20	91.60	87.80	94.40	75.20	74.95	79.35	76.71	75.54	86.11	103.57
GRAND TOTAL FOR NATAL (including Zululand)	20.44	19.28	20.38	20.75	22.39	18.90	19.29	20.24	20.84	20.10	21.27	23.75
Ratio to 1926 (= 100)	100.00	94.30	99.70	101.50	109.50	92.60	94.40	99.02	101.96	98.34	104.06	116.19
Average Rainfall of all Districts (inches)	—	—	—	48.94	38.74	29.86	51.07	31.89	46.62	43.40	50.81	40.62

AREA OF CANE HARVESTED AND YIELDS BY DISTRICTS (EUROPEAN PLANTERS ONLY).—(Continued).

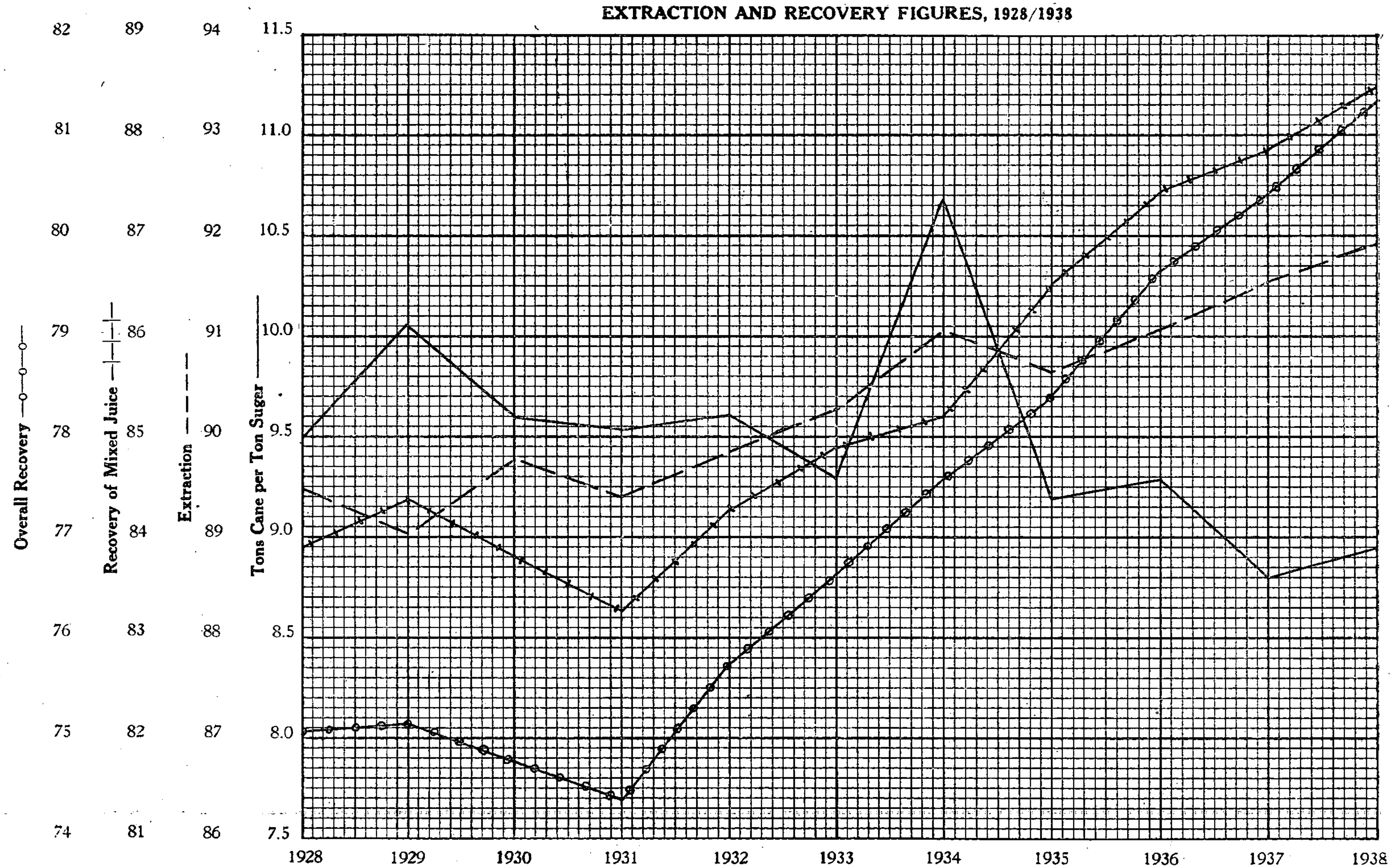
COMPILED FROM UNION DEPARTMENT OF CENSUS RETURNS.

DISTRICT.	Tons Cane per Acre, 1937/38.		Percentage (Area) of Non-Uba Canes under Cultivation.					Acreage under Cultivation 1937/38. Plant Cane.			Acreage under Cultivation 1937/38. First Ratoon.		
	Uba.	Non-Uba.	1933/4.	1934/5.	1935/6.	1936/7.	1937/8.	Uba.	Non-Uba.	Non-Uba % of Total	Uba.	Non-Uba.	Non-Uba % of Total
Port Shepstone	19.42	25.54	0.3	4.4	19.5	36.3	48.8	—	2,502	100.0	969	1,573	61.9
Umzinto	19.94	27.06	2.4	10.3	23.4	40.8	50.3	440	18,382	97.7	1,912	11,755	86.0
Durban and Pinetown	18.46	23.00	2.1	12.1	30.2	48.9	67.4	199	7,159	97.3	540	1,954	78.3
Total South of Umgeni River..	19.70	26.20	2.2	10.0	24.0	41.4	53.0	639	28,043	97.8	3,421	15,282	81.7
Ratio to 1926 (= 100).. ..	106.80	142.10	—	—	—	—	—	—	—	—	—	—	—
Inanda	24.21	31.62	5.1	14.3	24.6	36.4	49.4	1,889	11,854	86.3	3,369	8,173	70.8
Lower Tugela	20.15	27.08	4.2	16.5	32.3	45.5	55.3	1,790	23,626	93.0	6,614	22,685	77.4
Total for North Coast between Umgeni and Tugela Rivers..	21.63	28.18	4.5	15.8	29.9	42.5	53.4	3,679	35,480	90.6	9,983	30,858	75.6
Ratio to 1926 (= 100).. ..	116.20	151.40	—	—	—	—	—	—	—	—	—	—	—
Total for Natal South of the Tugela (excluding Zululand)	20.95	27.47	3.6	13.6	27.8	42.1	53.2	4,318	63,523	93.6	13,404	46,140	77.5
Ratio to 1926 (= 100).. ..	112.90	148.10	—	—	—	—	—	—	—	—	—	—	—
Mtunzini	18.09	25.28	3.4	16.4	31.0	50.0	66.6	648	13,604	95.4	2,206	10,354	82.4
Eshowe	16.69	27.61	2.1	8.7	22.1	49.6	67.5	263	5,814	95.7	831	2,957	78.1
Lower Umfolozi	21.34	34.82	7.2	20.0	40.6	61.1	73.1	313	19,062	98.4	1,704	15,214	89.9
Hlabisa	17.89	33.22	4.4	17.2	34.5	52.2	70.2	185	3,209	94.5	644	1,749	73.1
Total North of the Tugela (Zululand)	19.03	31.06	5.1	17.2	34.5	55.1	69.9	1,409	41,689	96.7	5,385	30,274	84.9
Ratio to 1926 (= 100).. ..	79.90	130.30	—	—	—	—	—	—	—	—	—	—	—
GRAND TOTAL FOR NATAL (including Zululand)	20.38	28.91	4.2	14.9	30.1	46.5	58.8	5,727	105,212	94.8	18,789	76,414	80.3
Ratio to 1926 (= 100).. ..	99.70	141.40	—	—	—	—	—	—	—	—	—	—	—
Average Rainfall of all Districts (inches)	40.62	40.62	—	—	—	—	—	—	—	—	—	—	—


MONTHLY AVERAGES FOR NATAL SUGAR FACTORIES
Season 1938/39
82.5
82.0
81.5
81.0
80.5
80.0
79.5
79.0
78.5
90
89
88
87
86
85
98
97
96
95
94
93
92
91
Overall Recovery
Boiling House Recovery
Extraction
May
June
July
Aug.
Sept.
Oct.
Nov.
Dec.

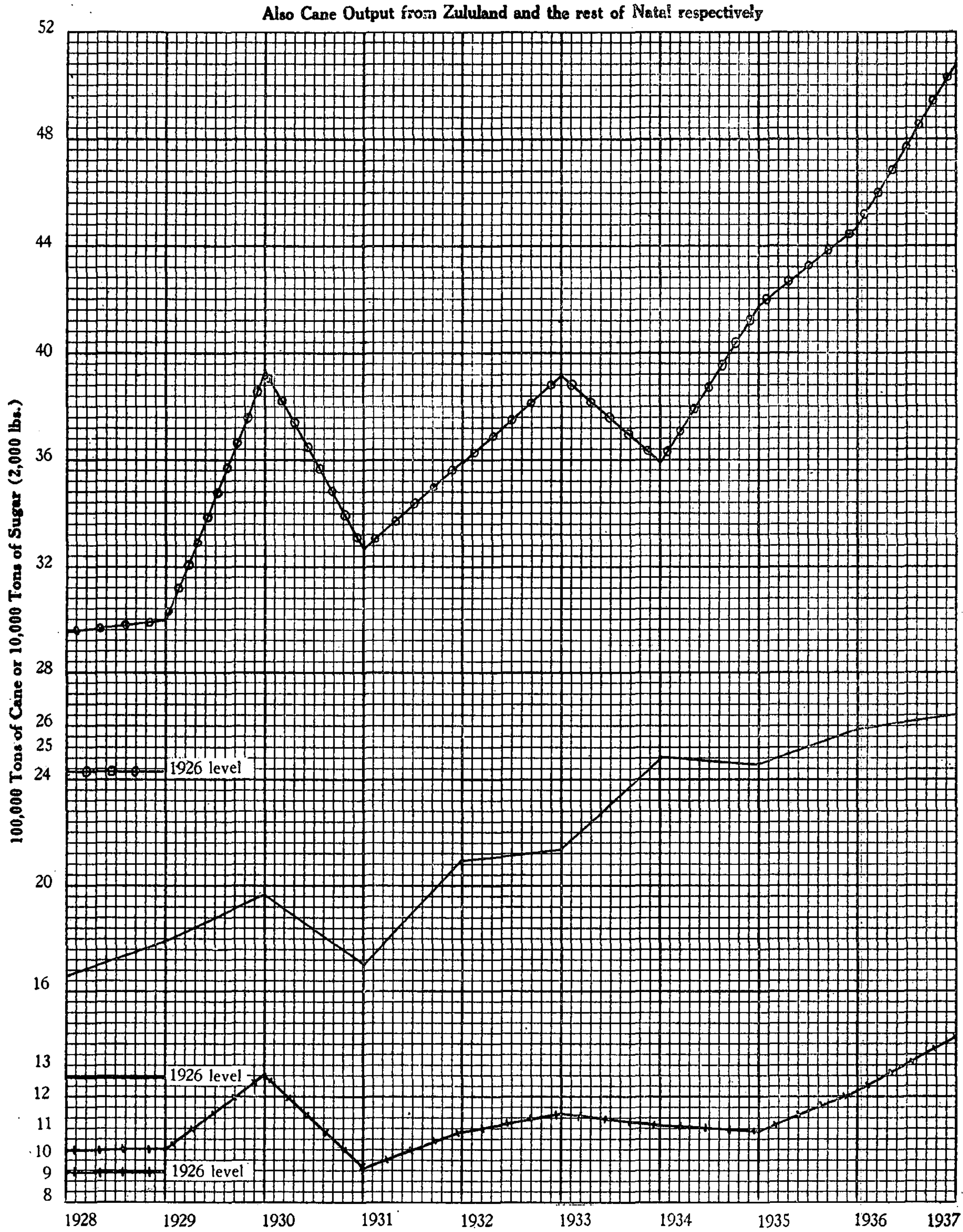

MONTHLY AVERAGES FOR NATAL SUGAR FACTORIES
Season 1938/39
Purity of Mixed Juice
Fibre % Cane
Sucrose % Cane
Tons Cane per Ton Sugar
90 16.4 14.5 12.0
89 16.1 14.0 11.5
88 15.8 13.5 11.0
87 15.5 13.0 10.5
86 15.2 12.5 10.0
85 14.9 12.0 9.5
84 14.6 11.5 9.0
83 14.3 11.0 8.5
82 14.0 10.5 8.0
May
June
July
Aug.
Sept.
Oct.
Nov.
Dec.

EXTRACTION AND RECOVERY FIGURES, 1928/1938



TOTAL OUTPUT OF SUGAR FROM NATAL, 1928/1937

Also Cane Output from Zululand and the rest of Natal respectively



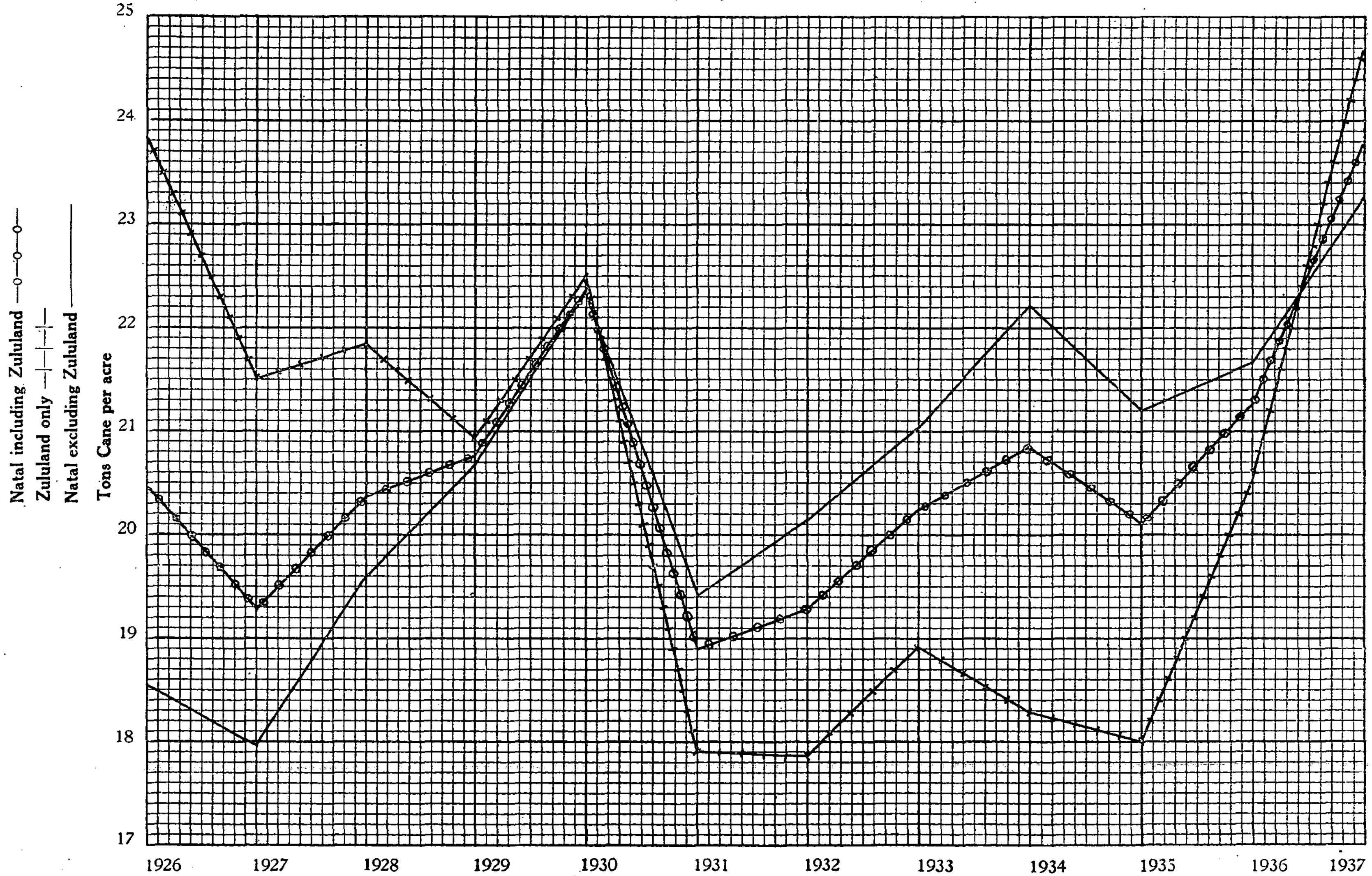
Total output of Sugar —o—o—o—

Cane output for Natal (excluding Zululand) ————

Cane output for Zululand —|—|—|—

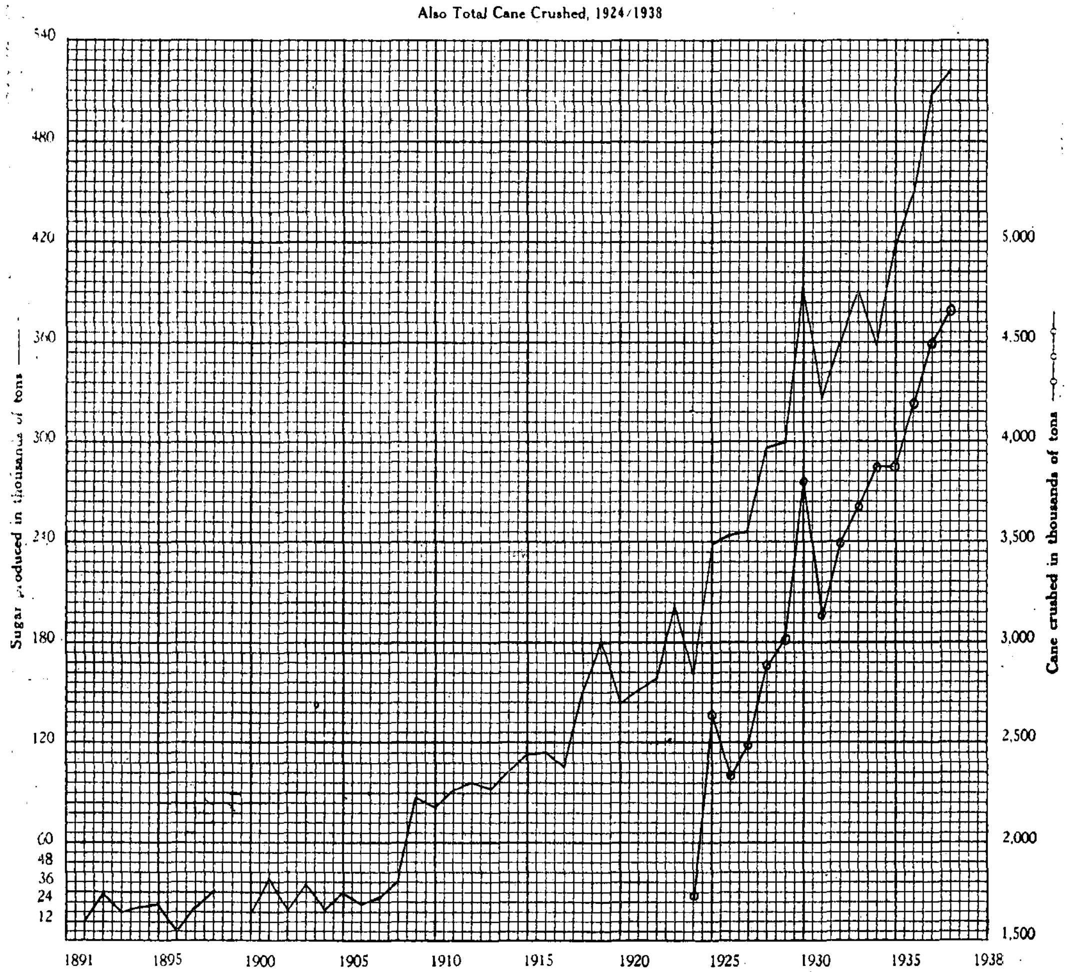
YIELD OF CANE IN TONS PER ACRE OVER RECENT YEARS

(European Planters)



TOTAL SUGAR PRODUCED IN NATAL, 1891/1938

Also Total Cane Crushed, 1924/1938



COMPARISON OF SEASON 1938 WITH MEAN OF SEASONS 1928/1937

Monthly fluctuations in Sucrose Content, Mixed Juice Purity and Fibre Content