

# ANNUAL SUMMARY OF CHEMICAL LABORATORY REPORTS FROM SOUTH AFRICAN SUGAR FACTORIES.

SEASON: 1941-1942.

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In our Annual Summary for 1940-41 presented last year we pointed out that the weather conditions of 1941 up to the middle of March were very unpromising for the coming crop, and that a small crop was to be expected for 1941-42.

## WEATHER CONDITIONS.

This forecast was amply fulfilled. Although the rainfall did improve considerably during the latter part of March and in April, it was too late to be of much avail, and the result was the smallest sugar crop since the 1936-37 season.

Not only were the crucial growing months of January and February very deficient in rainfall, but a drought of unexampled length and severity lasted from April 19th to September 11th, over which period a total of no more than 1.75 inches of rain fell at the Experiment Station. This no doubt partly accounts for the highest sucrose content of cane for the season in our records, but was also responsible for the great falling-off in quality of cane towards the end of the season.

The rainfall for December was also very deficient, only 1.70 inches, and the total for the year at the Experiment Station 24.35 inches, the lowest on record at Mount Edgecombe, records going back 55 years. The average for 44 recording stations in the sugarcane belt was 26.18 inches, the normal over the past 13 years being 40.96 inches.

A feature was the incidence of drought over the whole area, the district rainfalls ranging from 16.45 inches or only 47 per cent. of normal at Riverview (Umfolozi) to 39.08 inches or 78.5 per cent. of normal at Mtunzini. Besides in the extreme north from Mtubatuba to Mposa, the drought was also very marked in the extreme south from Port Shepstone to Esperanza, which had only about half the normal rainfall.

## PRODUCTION FIGURES.

Cane production for the season amounted to 3,921,436 tons of 2,000 lbs. (3,557,409 metric tons), which yielded 452,119 tons of 2,000 lbs. (410,149 metric tons) of sugar, a ratio of 8.67 of cane to sugar, or a yield of 11.53 per cent. of sugar on weight of cane.

In view of the short crop and increased demand for sugar, all except 3,000 tons of cane was supplied as main quota.

The source of cane classified according to type of grower shows relatively little percentage change from last season.

Type of grower.	Tons of cane harvested.	Per cent. of total.
European planters ... ..	2,241,567	57.1
Sugar manufacturers ... ..	1,359,790	34.7
Native and Indian planters ... ..	320,689	8.2
	<u>3,922,046</u>	<u>100.0</u>

The falling-off in cane production is most marked in the case of the Indian and Native grower, who has produced nearly 1 per cent. less of the total than last year.

## CANE VARIETY DATA.

Recent tendencies in the change of varieties harvested were continued.

	Per cent. of total crop.			
	1941/42.	1940/41.	1939/40.	1938/39.
Uba ... ..	16.6	23.2	30.2	32.2
Co.281 ... ..	42.4	37.5	28.3	21.0
Co.290 ... ..	26.5	28.2	30.0	35.0
Co.301 ... ..	5.9	3.3	2.4	0.3
P.O.J.2725 and 2878	8.6	7.8	9.1	11.3
	<u>100.0</u>	<u>100.0</u>	<u>100.0</u>	<u>100.0</u>

The proportion of Uba has diminished greatly in Zululand, not so much in central and southern districts. Co.281 is increasing in popularity everywhere, no factory crushing less than 20 per cent. of this variety. The P.O.J. canes are now largely confined to the Zululand alluvial flats.

Co.290 is diminishing except in certain districts where it is best suited, while Co.301 is increasing very rapidly, especially in the central North Coast, several of the factories in that area already recording more than 10 per cent. of the crop in this variety.

The average cane analyses for the 13 factories where the Central Board testing service is in operation shows the same relative positions as last year in the different varieties in sucrose content and purity, but the difference in sucrose content between Uba and the other varieties is not quite so marked as in recent years. This may possibly be accounted for by Uba benefiting more than the other varieties from the factors that have contributed to a high sucrose content of cane generally, or it may be partly due to the fact that more mixed consignments of Uba and other varieties have been sent to the factory and recorded as Uba for payment purposes.

Variety.	Per cent. total cane.	Per cent. total sucrose.	Sucrose per cent. cane.	Purity of crusher juice.	Java Ratio.
Uba... ..	15.04	14.51	13.63	86.43	76.99
Co.281 ... ..	44.85	45.41	14.30	89.00	76.93
Co.290 ... ..	28.64	28.37	13.99	87.94	78.93
Co.301 ... ..	6.05	6.05	14.12	88.20	76.83
P.O.J.2725 and 2878 ... ..	5.42	5.66	14.76	88.81	80.68
Total... ..	<u>100.00</u>	<u>100.00</u>	<u>14.12</u>	<u>88.13</u>	<u>77.68</u>

These figures refer to 60 per cent. only of the sugar output, but may be considered fairly representative of the whole, except in their proportion of P.O.J. canes, which is 3 per cent. below the actual, because one of the factories omitted from the returns is Umfolozi, crushing 60 per cent. of P.O.J. canes.

## GENERAL QUALITY OF CANE.

The sucrose content of cane for the season, 14.00 per cent., is the highest in our records, compiled since 1925. This is partly due to drought conditions, other high seasonal figures being 13.88 per cent. in 1933 and 13.84 in 1931, both years of severe drought.

The peak month was, as usual, September, when the sucrose content of cane was 14.80 per cent., after which there was a sudden fall to 14.08 in October.

The fibre content of the cane was also abnormally high, being 15.66 per cent. for the season, which is the highest since the drought-stricken years of 1931 and 1933.

Like last season, and unlike any other previous seasons, the fibre content steadily increased from 15.33 per cent. in June to a maximum of 15.94 in November. This is a characteristic of Coimbatore canes which we may expect to become normal experience in this country, now that the crop consists largely of Co. varieties.

The purity of mixed juice for the season was 85.67, which is about the average of recent years. The peak of purity was not as usual in October, but in September, when it was 86.23. It fell off rapidly thereafter and was only 85.26 for November, the lowest for that month for many years.

The reducing sugar ratio in mixed juice for the season was also about normal at 3.35.

One welcome feature of the season was that the largest proportion of cane since 1935 was harvested in what we have termed the "optimum period" from July to November inclusive. Although a relatively large quantity of cane, 821,155 tons, was milled in May and June, the crop was practically finished by the end of November, only about 82,531 tons being left to cut later than that. Consequently much less sucrose has been sacrificed through unseasonable harvesting than in recent years.

**Comparison of results from cane harvested during the July—November period, compared with those of earlier and later months of the harvesting season.**

		Per cent. total Cane.	Ratio Cane/Sugar.	Sucrose per cent.	Fibre per cent.	Purity Mixed Juice.
1928	Optimum period	75.74	9.20	14.07	15.75	85.07
	Balance of crop	24.26	10.17	12.97	16.31	84.31
1929	Optimum period	73.06	9.74	13.28	15.44	86.34
	Balance of crop	26.94	11.04	12.29	15.82	84.35
1930	Optimum period	70.95	9.20	14.08	15.60	86.27
	Balance of crop	29.05	10.07	13.09	15.91	85.16
1931	Optimum period	77.86	9.29	14.13	15.57	85.33
	Balance of crop	22.14	10.20	12.75	16.23	84.32
1932	Optimum period	81.10	9.32	13.79	15.44	85.01
	Balance of crop	18.90	10.82	12.28	16.25	84.76
1933	Optimum period	73.97	8.93	14.17	15.68	85.51
	Balance of crop	26.03	10.27	13.03	15.74	83.47
1934	Optimum period	81.35	10.54	11.95	15.12	84.09
	Balance of crop	18.65	11.16	11.52	15.57	83.83
1935	Optimum period	78.80	9.03	13.83	15.81	86.62
	Balance of crop	21.20	9.78	13.06	15.94	85.74
1936	Optimum period	75.71	9.02	13.62	14.85	85.73
	Balance of crop	24.29	10.27	12.27	15.46	84.12
1937	Optimum period	71.73	8.46	14.32	15.02	86.22
	Balance of crop	28.27	9.81	12.67	15.51	83.66
1938	Optimum period	73.00	8.57	14.04	14.37	86.84
	Balance of crop	26.10	9.95	12.50	14.77	84.43
1939	Optimum period	66.56	8.55	13.89	14.65	87.10
	Balance of crop	33.44	9.85	12.46	15.11	85.06
1940	Optimum period	66.83	8.86	13.63	15.54	86.02
	Balance of crop	33.17	10.07	12.27	15.63	83.85
Mean, 1928/1940—						
	Optimum period	74.43	9.13	13.75	15.30	85.86
	Balance of crop	25.57	10.27	12.55	15.71	84.39
1941	Optimum period	76.55	8.42	14.28	15.69	85.91
	Balance of crop	23.45	9.35	13.09	15.56	84.89

**GENERAL FACTORY PERFORMANCE.**

This has shown a further considerable improvement, made possible by the smaller crop and less overloading of the factories. The extraction, sucrose in juice per cent. of sucrose in cane, has increased to 92.37 for the season, the previous best being 92.24 in 1939. This is in spite of the high fibre of cane; the reduced extraction calculated to an assumed fibre content of 12.5 per cent. is 94.13, which compares favourably with the reduced extraction of most other countries having a much lower fibre

content of cane. The previous best reduced extraction in this country was 93.72 in 1940.

The boiling house recovery, sucrose in sugar per cent. of sucrose in juice, was 88.40, a figure that was surpassed in the 1938 and 1939 seasons, when, however, the purity of mixed juice was much better. The reduced boiling house recovery, calculated to an assumed purity of 85 in mixed juice, is 87.76, the highest ever recorded in this country.

Similarly the overall recovery, sucrose in sugar per cent. of sucrose in cane, 81.66 for the season, was somewhat higher in 1939, when there was a lower fibre content and higher purity of mixed juice.

The reduced overall recovery, calculated to an assumed fibre content of 12.5 per cent. and a mixed juice purity of 85, is 82.61, which has never been excelled in this country, the previous best being 82.07 in 1940.

The sucrose content of the bagasse, 3.03 per cent. is only very slightly higher than in 1940, when the original sucrose content of the cane was much less. The primary juice loss, 41.12, is the lowest on record for this country.

The ratio of cane to sugar, 8.62 actual, and 8.39 on an assumed polarization of 96°, is the best on record in South Africa, the previous lowest being 8.80 and 8.58 respectively in the 1937 season, another year that combined a high sucrose content of cane with improved efficiency figures.

The moisture content of bagasse is still very high, 51.50 per cent. for the season, and appears to be at present the principal obstacle in getting really excellent extraction results. Imbibition is high, 34.76 per cent. of cane, and the sucrose content of bagasse compares favourably with that of most countries.

With the increased use of modern continuous filters, the loss of sucrose in filter cake in South Africa has diminished very considerably in recent years and will now compare favourably with that of almost any country.

Total boiling house losses continue to be somewhat high, however, due to high losses of sucrose in molasses, associated with a high purity of final molasses at most factories.

**SEASONAL FLUCTUATIONS.**

The peak month of extraction was, as usual, September, when it was 92.58, but the best boiling house recovery, 88.91, was as early as August. Consequently the best overall recovery, 82.31, was also gained in August.

The best ratio of cane to sugar, 8.12, was recorded in September, however, because of the higher sucrose content of cane in that month.

**INDIVIDUAL FACTORY RECORDS.**

The identity of the numbers representing the factories remains the same. The only factories not included in our returns are three small factories that have not complete chemical control; their combined output of sugar is only 6,700 tons, or 1.5 per cent. of the industry total.

As in the 1940/41 season, but not quite to the same extent, there were wide differences between the closing dates at various factories, a fact that needs to be borne in mind when considering factory performances and relative efficiencies. Obviously, those factories which were in a position to confine their manufacturing activities more closely within the best months of the season scored in improved quality of cane and consequent recoveries.

The highest sucrose content of cane was recorded at factory No. 21, 15.17 per cent. for the season; the only other one with over 15 per cent. was No. 3.

Although these two factories are located widely apart, both draw the bulk of their supplies of cane from land at a considerable altitude and some distance from the coast.

Factories Nos. 3 and 4, both closing down before the end of October, had the lowest fibre contents of cane, 14.23 and 14.54 per cent. respectively. No. 2, which did not close down until January 5th, also had the relatively low fibre content of 14.72 per cent.

Factory No. 3 recorded also the highest purity of mixed juice, 88.82, followed by No. 21 with 88.27.

Factory No. 15 again showed the lowest reducing sugar ratio in mixed juice, 2.30.

The highest extraction is gained by factory No. 3 with 95.22; the only other factory with an extraction of over 94 is No. 1 with 94.52. Since No. 1 had a much higher fibre content to contend with, it has the lower milling loss, 4.77; but No. 3 gains the lowest extraction ratio, 0.34, and the lowest primary juice loss, 28.81.

Two factories have a boiling house recovery of over 90—No. 16 with 91.17 and No. 20 with 90.61.

The highest overall recovery, 85.16, is gained by factory No. 3; two others, Nos. 16 and 20, reached 84.72. The only other factory with an overall recovery of over 84 was No. 1 with 84.46; it should be pointed out that this factory made most of its sugar into a refined grade of average polarization 99.9°, and that its average polarization of all sugars was 99.43°. The other three factories gaining a higher recovery made mainly sugars of polarization under 99°.

As before, there is a range of over 10 units between the highest and the lowest factories in this most important figure.

Factories Nos. 2, 15 and 18, and especially No. 3, show the biggest improvement over last season's work in this respect.

The lowest ratio of cane to sugar, 7.67, was gained by No. 3, No. 21 also showing a ratio of less than 8.

No. 3 factory also achieved the very low moisture content of bagasse of 43.32 per cent, only three other factories showing less than 50 per cent.

The lowest purity of final molasses was gained by No. 16 with 36.36; only three others had less than 40, while some were over 46.

Two factories crushed over 400,000 tons of cane, No. 5 making 54,390 tons of sugar and No. 1, 51,419 tons; the latter had the highest crushing rate, 127.04 tons of cane per hour in a single train of mills. No. 5 factory, with 125.84 tons, and No. 12, with 102.49 tons, are both double tandem mills.

#### RESULTS FROM OTHER SUGAR INDUSTRIES.

Although we have not received reports from certain other countries overseas, such as Hawaii and Formosa, we record, as in recent years, results from Mauritius, Queensland and Puerto Rico, and have added this year British Guiana, India, Trinidad and Louisiana, all of which are of much interest and information to us.

#### ACKNOWLEDGMENTS.

We are indebted for these data to the Sugar Technology Division of the Department of Agriculture of Mauritius, the Queensland Bureau of Sugar Experiment Stations, the Sugar Producers' Association of Puerto Rico, the Central Laboratory of Booker Bros., McConnell & Co., Ltd., Demerara, the Sugar Technologists' Association of India, the Sugar Manufacturers' Association of Trinidad, and Gilmore's "Louisiana Sugar Manual."

#### WORLD PRODUCTION OF SUGAR.

Willett and Gray's estimates have again been freely drawn on to supplement our private sources of information, but we can this year estimate the world's cane sugar production only; owing to the war no information is available concerning the beet sugar output of many European countries.

The following is the estimated sugar production of the British Empire for 1941/42:—

		Tons of 2,240 lbs.	Per cent. of total.
India ... ..	(raws)	1,587,500*	46.7
	(white)	1,100,000†	
Australia ... ..		785,000†	13.6
Great Britain ... ..		595,000†	10.3
British West Indies ... ..		460,110†	8.0
South Africa ... ..		403,878	7.0
Mauritius ... ..		318,596	5.5
British Guiana ... ..		190,000	3.3
Fiji ... ..		120,000†	2.1
Canada... ..		110,000†	1.9
Ireland... ..		90,000†	1.6
Total ... ..		5,759,884 tons.	

\* From 3,175,000† tons of gur calculated as equivalent to half its weight in sugar.

† Willett and Gray's estimates.

‡ Including Jamaica 167,110† tons, Trinidad 150,000 tons, Barbados 95,000† tons, Antigua 38,000† tons, other islands 10,000† tons.

Thus South Africa has fallen from third to fifth place in Empire production of sugar, and its proportion from 8.8 to 7.0 per cent.

The total world cane sugar production for 1941/42 is estimated to be 18,987,610 tons, of which South Africa contributed 2.1 per cent.

#### SUGAR PRODUCTION IN SOUTH AFRICA IN RECENT YEARS.

To economise in space, we have this year recorded sugar production only from 1929/30. For earlier years we must refer our readers to our annual summary for 1940/41.

Production figures are in tons of 2,000 lbs.

The rainfall figures now quoted are the average of 44 recording stations in the sugar-growing districts, and not, as heretofore, the annual rainfall at the Experiment Station only.

Season.	Cane crushed.	Inches of rainfall.	Sugar produced.	Ratio Cane/ Sugar.
1929/30 ... ..	3,005,663	48.30	298,635	10.06
1930/31 ... ..	3,803,883	37.20	393,205	9.67
1931/32 ... ..	3,130,783	29.39	325,899	9.61
1932/33 ... ..	3,489,960	48.20	358,905	9.72
1933/34 ... ..	3,673,375	31.12	391,173	9.39
1934/35 ... ..	3,874,215	44.60	358,738	10.80
1935/36 ... ..	3,867,536	46.12	417,289	9.27
1936/37 ... ..	4,180,973	50.10	446,409	9.37
1937/38 ... ..	4,489,022	39.48	507,219	8.85
1938/39 ... ..	4,658,962	40.38	522,732	8.91
1939/40 ... ..	5,346,006	47.63	595,556	8.98
1940/41 ... ..	5,309,227	43.37	572,880	9.72
1941/42 ... ..	3,921,436	26.18	452,119	8.67

## APPENDIX

## SUGARCANE STATISTICS, 1940/41 CROP, BASED ON THE UNION GOVERNMENT DEPARTMENT OF CENSUS REPORTS FOR SUGARCANE OWNED BY EUROPEANS.

The Special Census of Sugarcane Plantations for this season 1940/41 was received from the Office of Census on 25th March, and the following data are quoted or calculated from the statistics given therein.

It will be recollected that although the rainfall for 1940 was very unfavourably distributed, the total for the year was not much below normal, except on the South Coast and the Umhlabi-Chakas Kraal area; it was, in fact, considerably above normal at practically all Zululand stations. Consequently the total crop was only slightly below that of 1939.

The area of cane harvested was the largest for some years in nearly every district, 174,131 acres in all being harvested. This increase was more marked in the districts south of the Tugela, which supplied 66.8 per cent. of the total area harvested, one of the largest proportions on record; while the proportion from each of the Zululand divisions showed a slight fall, except in the Eshowe district, over recent years.

The quantity of cane harvested showed an appreciable falling-off in all South Coast districts and over the greater part of Zululand, but increased in the central North Coast districts of Inanda and Lower Tugela. The latter again produced the largest quantity of cane of any single division, amounting to 1,299,769 tons, 27.1 per cent. of the total, from 47,529 acres. Inanda came second and Lower Umfolozi third in cane production with 17.0 and 16.0 per cent. of the total respectively.

## YIELD OF CANE PER ACRE, 1940/41 SEASON.

Every district showed a considerable falling-off in yield per acre, this being most marked in the South Coast districts that had suffered very deficient rainfall in 1940, besides the general unfavourable distribution of rain.

The highest yield of cane per acre was again recorded for Inanda with 33.24 tons, being 26.34 tons for Uba, and 36.43 for all other varieties combined.

Lower Umfolozi, as before, came second in this respect with 31.00 tons per acre, 19.71 for Uba and 32.09 for all other varieties. Zululand as a whole again maintained a larger yield of all cane per acre than the rest of Natal, which it has now done for four successive seasons, although the yield of Uba cane is less in Zululand than south of the Tugela.

For the country as a whole the yield of cane per acre was 27.53 tons for the 1940/41 season, second only to the 1939/40 season, when it was 30.22 tons. The average yield for Uba was 20.95 tons per acre, a figure which has remained remarkably constant since 1926, except for the boom year of 1939 when it was 23.34, notwithstanding the fact that the Uba cane now being harvested is nearly all second, third and fourth ratoons. The average yield for all other varieties in 1940/41 was 29.79 tons per acre.

The gradual elimination of Uba cane is well shown in the following tables. It must be kept in mind, however, that these statistics refer only to European planters; and it is evident that Indian and Native planters are still growing considerable proportions of Uba.

## Area under Cane, 30th April, 1941.

	Acres.	Per cent, non-Uba.
Plant cane ... ..	78,564	98.6
First ratoon ... ..	80,748	96.2
Second ratoon ... ..	83,683	89.7
Third ratoon ... ..	51,606	66.0
Fourth ratoon ... ..	23,001	29.1
Other ratoons ... ..	15,294	14.8
Total ... ..	332,896	82.1

## Area Reaped, Yield of Cane, and Average Yield per Acre. Period 1st May, 1940, to 30th April, 1941.

	Area reaped.		Yield.		Tons per acre.	
	Acres.	% non-Uba.	Tons.	% non-Uba.	Uba.	Non-Uba.
Plant cane ...	38,681	98.6	1,343,220	98.9	26.7	34.8
First ratoon ...	48,966	93.1	1,448,654	94.6	23.2	30.1
Second ratoon ...	43,099	76.8	1,087,121	79.0	22.8	26.0
Third ratoon ...	23,139	42.6	521,438	44.9	21.6	23.8
Fourth ratoon ...	11,540	21.7	226,919	27.0	18.3	24.5
Other ratoons ...	8,706	9.1	169,876	11.0	19.1	23.6
Total ...	174,131	74.6	4,797,228	80.7	21.0	29.8

Herewith are yields of cane and sugar per acre for recent seasons:—

	Tons Cane per acre.	Tons Sugar per acre harvested.	Tons Cane per ton of Sugar.
1926/27 ... ..	20.44	2.06	9.92
1927/28 ... ..	19.28	1.99	9.69
1928/29 ... ..	20.38	2.15	9.49
1929/30 ... ..	20.75	2.06	10.06
1930/31 ... ..	22.39	2.33	9.59
1931/32 ... ..	18.90	1.98	9.53
1932/33 ... ..	19.29	2.02	9.61
1933/34 ... ..	20.24	2.18	9.28
1934/35 ... ..	20.84	1.95	10.67
1935/36 ... ..	20.10	2.19	9.19
1936/37 ... ..	21.27	2.29	9.29
1937/38 ... ..	23.75	2.70	8.80
1938/39 ... ..	27.37	3.08	8.89
1939/40 ... ..	30.22	3.38	8.95
1940/41 ... ..	27.55	2.98	9.26

This table shows the improvement in yield of sugar per acre in recent years due to increased yields of cane per acre and lower ratios of cane to sugar.

This is only part of the story, however; there has undoubtedly been a tendency to cut cane after a shorter period of growth than formerly. Unfortunately, there seems to be no way of arriving at the average age of the cane crop at time of harvesting, but most probably the yield of sugar per acre per annum has increased more than the above table indicates.

## GENERAL ACKNOWLEDGMENTS.

The writers wish to thank all those whose co-operation has made this compilation possible; this includes, besides those in other countries who have been mentioned, the South African manufacturing companies who have contributed their individual reports and data, the Union Government Director of Census, the Sugar Industry Central Board, and the clerical staffs of the Durban office of the Sugar Association and the Experiment Station.

Experiment Station,  
South African Sugar Association,  
Mount Edgecombe.  
April, 1942.

**Average Manufacturing Results by periods for Natal Sugar Factories Reporting to the Experiment Station, Season 1941/42.**

Period ending .. .. .	MAY 31, 1941.	JUNE 28, 1941.	AUG. 2, 1941.	AUG. 30, 1941.	SEPT. 27, 1941.	NOV. 1, 1941.	NOV. 29, 1941.	SEASON 1941-42.
Tons of 2,000 lbs. Cane crushed .. . This period To date	176,551	600,461 821,155	785,465 1,606,618	622,856 2,206,377	611,442 2,856,127	661,197 3,517,324	253,687 3,771,011	<b>3,853,542</b>
Tons of 2,000 lbs. Sugar bagged and estimated.. This period To date	17,807	65,468 87,926	91,114 179,070	75,774 252,265	75,321 331,985	77,315 409,301	28,923 438,268	<b>447,009</b>
Tons Cane per ton Sugar .. . This period To date	9.91	9.17 9.34	8.62 8.97	8.22 8.75	8.12 8.60	8.55 8.59	8.77 8.60	<b>8.62</b>
Tons Cane per ton of Sugar, calculated as sugar of } This period 96° Pol .. . } To date	9.65	8.93 9.09	8.39 8.73	8.00 8.52	7.90 8.37	8.32 8.36	8.56 8.37	<b>8.39</b>
Sucrose per cent. Cane .. . This period To date	12.43	13.30 13.09	13.99 13.53	14.58 13.83	14.80 14.03	14.08 14.04	13.77 14.02	<b>14.00</b>
Fibre per cent. Cane .. . This period To date	15.75	15.53 15.58	15.60 15.59	15.62 15.59	15.66 15.61	15.78 15.64	15.94 15.66	<b>15.66</b>
Java Ratio .. . This period To date	78.28	78.58 78.49	78.22 78.35	77.88 78.23	77.81 78.11	76.74 77.85	76.43 77.76	<b>77.74</b>
Sucrose per cent. Bagasse .. . This period To date	2.83	3.04 2.97	3.10 3.03	3.11 3.05	3.11 3.07	2.94 3.05	2.92 3.00	<b>3.03</b>
Moisture per cent. Bagasse .. . This period To date	52.23	51.67 51.93	51.56 51.75	51.16 51.62	51.23 51.50	51.50 51.50	51.80 51.52	<b>51.50</b>
Imbibition per cent. Cane .. . This period To date	35.03	34.86 34.86	35.03 34.94	35.22 35.03	34.87 34.96	34.72 34.92	33.78 34.84	<b>34.76</b>
Extraction .. . This period To date	91.85	91.98 91.99	92.21 92.10	92.58 92.27	92.65 92.33	92.62 92.38	92.39 92.38	<b>92.37</b>
Recovery on Mixed Juice .. . This period To date	87.16	87.86 87.67	88.64 88.17	88.91 88.39	88.67 88.46	88.46 88.47	88.19 88.46	<b>88.40</b>
Overall Recovery .. . This period To date	80.06	80.81 80.65	81.73 81.20	82.31 81.56	82.15 81.67	81.93 81.73	81.48 81.72	<b>81.66</b>
Purity of Mixed Juice .. . This period To date	84.11	85.18 84.97	85.84 85.41	85.87 85.55	86.23 85.70	85.93 85.75	85.26 85.71	<b>85.67</b>
Reducing Sugar Ratio .. . This period To date	4.61	3.90 3.98	3.35 3.67	3.28 3.55	3.04 3.43	3.02 3.33	3.19 3.31	<b>3.35</b>
Purity of Syrup .. . This period To date	85.68	87.07 86.73	87.76 87.24	87.90 87.42	88.26 87.61	88.30 87.75	87.51 87.73	<b>87.69</b>
Sucrose in Filter Cake (A) .. . This period To date	0.82	1.92 1.92	2.00 1.96	1.90 1.86	2.11 2.05	1.72 2.07	2.11 2.08	<b>2.09</b>
Purity of Final Molasses .. . This period To date	38.32	41.87 41.97	41.93 41.54	43.45 42.52	44.15 42.84	44.57 43.20	45.70 43.38	<b>43.45</b>
Average Polarization of Sugar .. . This period To date	98.63	98.59 98.59	98.58 98.59	98.64 98.61	98.68 98.61	98.61 98.61	98.40 98.60	<b>98.58</b>
SO <sub>2</sub> in Sugar p.p.m.... This period To date	69.80	58.69 61.31	54.65 58.54	49.32 51.94	49.35 51.25	45.47 50.12	52.61 50.33	<b>50.86</b>

(A) Arithmetic averages.

## FINAL MANUFACTURING RESULTS, NATAL SUGAR FACTORIES, SEASON 1941/42.

FACTORY NUMBER	1	2	3	4	5	6	8	9	10	11	12	14	15	16	17	18	19	20	21	SEASON	
Crushing period	From	28.5.41	11.6.41	4.6.41	27.5.41	2.5.41	26.5.41	2.6.41	13.5.41	1.5.41	4.6.41	1.5.41	1.5.41	3.6.41	28.5.41	7.6.41	15.5.41	22.5.41	1.5.41	3.6.41	1.5.41
	To	18.11.41	5.1.42	20.10.41	31.10.41	7.11.41	7.12.41	22.12.41	19.10.41	13.12.41	25.10.41	1.11.41	23.11.41	26.11.41	25.9.41	6.9.41	22.11.41	10.10.41	17.11.41	10.11.41	5.1.42
Tons of 2,000 lbs. Cane crushed		440,420	279,898	33,507	190,019	459,469	338,440	168,274	80,949	310,678	202,331	350,909	276,729	123,764	61,417	38,309	131,900	77,772	150,346	138,411	3,853,542
Cane crushed—metric tons		399,549	253,923	30,398	172,385	416,830	307,032	152,658	73,437	281,847	183,554	318,344	251,048	112,279	55,717	34,754	119,660	70,555	136,394	125,566	3,495,930
Tons of 2,000 lbs. Sugar bagged and estimated		51,419	31,393	4,370	21,777	54,390	40,286	19,240	9,800	35,065	21,827	39,145	33,140	13,934	7,392	4,399	15,599	8,298	17,930	17,605	447,009
Sugar bagged and estimated—metric tons		46,647	28,480	3,964	19,756	49,343	36,547	17,455	8,891	31,811	19,801	35,512	30,065	12,641	6,706	3,991	14,151	7,528	16,266	15,971	405,526
Tons Cane per ton of Sugar		8.56	8.92	7.67	8.72	8.45	8.40	8.74	8.26	8.86	9.27	8.96	8.35	8.88	8.31	8.71	8.46	9.37	8.38	7.86	8.62
Tons Cane per ton of Sugar calculated as Sugar of 96 <sup>o</sup> Pol.		8.26	8.74	7.45	8.43	8.26	8.23	8.74	8.05	8.59	8.97	8.72	8.13	8.61	8.09	8.57	8.25	9.08	8.14	7.60	8.39
Time Crushing per cent. Available Time (no allowance for cane shortage)		98.15	96.08	97.58	95.85	95.31	96.85	93.76	97.30	98.50	95.44	97.50	96.99	92.47	96.87	97.36	97.51	94.32	98.11	98.17	96.65
Tons of 2,000 lbs. of Cane per hour Actual Crushing		127.04	71.67	12.71	61.62	125.84	90.57	48.98	27.70	73.48	80.58	102.49	71.17	38.22	27.50	22.13	35.01	29.87	37.66	44.10	79.88
Tons of 2,000 lbs. White Sugar made		38,960	37	2,706	14,482	—	—	—	—	8,500	—	—	—	5,084	—	12	11	4,864	—	7,565	82,221
Tons of 2,000 lbs. Government Grade Sugar made		9,948	10,598	430	—	350	32,612	—	210	160	12,130	1,415	11,786	2,397	—	284	12,323	—	—	4,434	99,077
Tons of 2,000 lbs. Raw Sugar made		2,511	20,758	1,234	7,295	54,040	7,674	19,240	9,590	34,880	1,197	37,730	21,278	6,453	7,392	4,103	3,265	3,434	17,930	5,606	265,610
Sucrose per cent. Cane		13.74	13.68	15.13	13.95	13.87	14.30	13.94	14.47	13.70	14.26	13.72	14.24	14.00	14.01	13.94	14.22	14.18	13.90	15.17	14.00
Fibre per cent. Cane		15.74	14.72	14.23	14.54	15.60	16.32	15.57	16.22	15.48	16.40	15.78	15.48	15.91	15.43	15.40	14.96	17.52	16.75	15.42	15.66
Java Ratio		77.12	78.60	79.07	78.15	78.63	77.56	78.78	78.12	77.23	78.22	76.80	77.33	75.19	79.08	77.75	78.42	77.71	76.50	79.18	77.74
Milling Loss		4.77	7.37	5.07	8.23	5.84	6.59	8.02	6.69	6.07	10.32	7.76	6.43	7.23	6.42	8.61	7.97	8.24	5.40	7.25	6.83
Extraction Ratio		0.35	0.54	0.34	0.59	0.42	0.46	0.57	0.46	0.44	0.72	0.57	0.45	0.52	0.46	0.62	0.56	0.58	0.39	0.48	0.49
Primary Juice Loss		29.34	45.94	28.81	50.37	35.60	38.56	48.64	38.84	37.46	60.56	47.71	38.06	43.39	38.75	52.35	47.69	47.97	32.31	40.43	41.12
Imbibition per cent. Cane		41.08	30.55	31.76	33.26	29.71	33.05	39.57	35.30	31.38	32.43	41.36	35.10	35.02	36.05	32.31	35.54	32.91	31.48	38.02	34.76
Extraction (Sucrose in Mixed Juice % Sucrose in Cane)		94.52	92.07	95.22	91.43	93.42	92.48	91.03	92.48	93.14	88.12	91.06	93.03	91.79	92.93	90.47	91.61	89.81	93.50	92.63	92.37
Sucrose per cent. Bagasse		2.16	3.08	2.71	3.58	2.67	2.99	3.59	3.23	2.71	4.54	3.29	2.73	3.27	3.10	4.00	3.52	3.68	2.51	3.27	3.03
Moisture per cent. Bagasse		52.03	54.09	43.32	51.81	50.80	50.76	50.53	47.74	51.86	50.11	53.36	54.06	50.71	47.37	48.36	51.24	50.56	50.25	50.57	51.50
Sucrose per cent. Cane lost in manufacture		2.14	2.71	2.25	2.56	2.24	2.63	2.97	2.55	2.53	3.55	2.71	2.44	2.85	2.14	2.73	2.58	3.60	2.12	2.54	2.57
Overall Recovery (Sucrose in Sugar % Sucrose in Cane)		84.46	80.24	85.16	81.62	83.84	81.60	78.72	82.37	81.55	75.09	80.26	82.88	79.64	84.72	80.41	81.84	74.66	84.72	83.22	81.66
Recovery on Mixed Juice (Sucrose in Sugar % Sucrose in Mixed Juice)		89.35	87.15	89.43	89.27	89.75	88.24	86.47	89.09	87.55	85.22	88.14	89.08	86.77	91.17	88.88	89.34	83.13	90.61	89.84	88.40
Available Sucrose % Sucrose in Mixed Juice		86.65	86.38	89.95	88.99	89.06	87.45	84.72	88.64	85.82	86.25	85.40	87.75	87.19	86.47	87.78	88.75	87.08	87.57	89.52	87.21
Recovery Efficiency (Sucrose in Sugar % Available Sucrose in Mixed Juice)		103.12	100.89	99.42	100.32	100.77	100.90	102.06	100.50	102.01	98.81	103.21	101.52	99.52	105.44	101.25	100.66	95.46	103.47	100.36	101.37
Sucrose in Bagasse per cent. Sucrose in Cane (A)		5.48	7.93	4.78	8.57	6.58	7.52	8.97	7.52	6.86	11.88	8.94	6.97	8.21	7.07	9.53	8.39	10.19	6.50	7.37	7.63
Sucrose in Filter Cake per cent. Sucrose in Cane (B)		0.52	1.36	—	0.17	0.28	0.17	1.93	0.59	0.57	—	0.30	—	0.38	0.17	1.15	—	—	0.18	0.08	0.52
Sucrose in Molasses per cent. Sucrose in Cane (C)		7.55	8.56	6.08	7.58	—	9.31	9.36	6.54	—	—	9.82	—	—	—	—	—	10.21	—	7.18	—
Undetermined Sucrose per cent. Sucrose in Cane (D)		1.99	1.91	3.98	2.06	9.30	1.40	1.02	2.98	11.02	—	0.68	—	11.77	8.04	8.91	—	4.94	8.60	2.15	10.18
Sucrose lost in Boiling House per cent. Sucrose in Cane (B)+(C)+(D)		10.06	11.83	10.06	9.81	9.58	10.88	12.31	10.11	11.59	13.03	10.80	10.15	12.15	8.21	10.06	9.77	15.15	8.78	9.41	10.70
Sucrose in total Losses per cent. Sucrose in Cane (A)+(B)+(C)+(D)		15.54	19.76	14.84	18.38	16.16	18.40	21.28	17.63	18.45	24.91	19.74	17.12	20.36	15.28	19.59	18.16	25.34	15.28	16.78	18.34
FIRST EXPRESSED JUICE—																					
Brix		20.36	19.94	21.14	20.09	20.12	21.04	20.27	20.72	20.30	20.70	20.47	20.83	20.93	20.21	20.63	20.54	20.79	20.45	21.21	20.48
Purity (apparent)		87.53	87.32	90.48	88.80	87.70	87.60	87.32	89.40	87.40	88.05	87.25	88.42	89.00	87.68	86.90	88.30	87.90	88.80	90.34	87.94
LAST EXPRESSED JUICE—																					
Brix		1.85	4.79	3.87	3.01	2.55	4.11	3.69	3.50	3.00	3.93	2.98	2.66	4.28	4.15	7.06	3.05	4.71	2.36	2.11	3.19
Purity (apparent)		80.13	75.99	83.72	75.40	77.30	76.80	76.69	80.30	76.40	77.50	76.90	78.64	80.60	72.46	77.10	79.17	77.30	76.70	74.88	77.46
Purity drop from First Expressed Juice		7.40	11.33	6.76	13.40	10.40	10.80	10.63	9.10	11.00	10.55	10.35	9.78	8.40	15.22	9.80	9.13	10.60	12.10	15.46	10.48
MIXED JUICE—																					
Brix		14.26	15.56	15.43	14.78	15.80	15.88	14.37	15.18	15.58	15.43	14.24	15.55	14.90	14.68	14.87	14.82	15.79	15.79	15.34	15.18
Purity (Claret)		85.69	84.90	88.82	86.50	85.80	85.80	84.27	86.70*	84.70	85.55	84.27	86.36	86.40*	85.19	85.40*	86.45	86.00	86.20*	88.27	85.67
Reducing Sugar Ratio		3.19	3.04	3.47	3.16	—	2.88	3.21	—	3.63	3.04	4.38	3.89	2.30	3.04	—	3.38	3.96	3.45	2.78	3.35
Purity drop from First Expressed Juice		1.84	2.42	1.66	2.30	1.90	1.80	3.05	2.70	2.70	2.50	2.98	2.06	2.60	2.49	1.50	1.85	1.90	2.60	2.07	2.27

**CLARIFIED JUICE—**

Brix .. .. .	14.09	14.26	15.30	15.12	15.66	17.01	13.52	15.50	13.80	14.91	14.03	13.44	14.41	14.41	14.32	14.87	17.91	14.55	14.69	14.74
Purity (apparent) .. .. .	92.61	86.57	90.72	87.30	87.00	86.10	86.09	87.70	86.40	85.79	85.30	88.36	87.20	86.25	86.70	87.50	86.80	87.50	89.58	87.50
Reducing Sugar Ratio .. .. .	1.30	2.36	3.25	—	—	2.61	2.82	—	3.19	—	3.91	2.88	2.19	2.76	—	—	3.11	3.24	2.06	2.66
pH .. .. .	7.01	7.30	—	7.04	7.80	7.88	—	—	7.50	7.16	7.30	7.44	—	7.53	7.40	—	—	7.64	7.38	7.42
Ash per cent. Brix .. .. .	2.23	3.47	—	—	—	—	—	—	—	—	3.62	3.28	—	—	—	—	—	—	—	—

**FILTER CAKE—**

Per cent. Sucrose .. .. .	0.68	4.06	—	0.43	0.90	0.48	3.98	1.62	2.23	0.70	0.86	3.53	0.74	0.48	4.33	3.64	8.12	0.41	0.36	1.71
Weight per cent. Cane .. .. .	10.59	4.59	—	5.61	4.38	4.86	6.78	5.24	3.50	—	4.76	—	7.09	5.00	3.63	—	—	6.25	2.78	5.63

**SYRUP—**

Brix .. .. .	53.00	55.09	55.49	55.29	50.17	51.25	54.01	51.80	55.41	54.06	59.84	55.88†	54.70	54.56	53.20	58.43	55.63	47.87	59.00	54.23
Purity (apparent) .. .. .	92.53	86.88	90.74	87.50	87.10	85.70	86.35	87.80	86.40	86.24	86.70	88.36	87.00	86.52	—	87.19	86.90	88.00	89.68	87.69
Reducing Sugar Ratio .. .. .	1.26	2.27	2.68	2.75	—	2.84	2.66	—	3.05	—	3.58	2.65	2.13	2.71	—	—	3.08	3.35	2.00	2.58
pH .. .. .	—	7.24	—	6.90	—	7.39	—	—	—	—	6.80	6.90	7.25	—	7.33	7.20	—	—	7.37	7.12
Purity drop from First Expressed Juice .. .. .	-5.00	0.44	-0.26	1.30	0.60	1.90	0.97	1.60	1.00	1.81	0.55	0.06	2.00	1.16	—	1.11	1.00	0.80	0.66	0.25
Purity increase from Mixed Juice .. .. .	6.84	1.98	1.92	1.00	1.30	-0.10	2.08	1.10	1.70	0.69	2.43	2.00	0.60	1.33	—	0.74	0.90	1.80	1.41	2.02

**FIRST MASSECUITE—**

Brix .. .. .	91.51	94.52	91.66	93.02	91.76	93.86	91.95	92.30	94.11	92.49	93.40	91.69†	91.12	92.38	92.10	92.52	91.80	90.70	91.52	92.54
Purity (apparent) .. .. .	92.04	76.11	84.93	85.80	85.90	79.80	83.90	81.80	85.71	85.50	81.70	82.99	85.40	86.42	80.50	79.96	86.40	88.10	87.61	84.10
Purity of Run-off .. .. .	75.33	58.38	63.90	65.40	68.30	57.40	65.45	61.40	59.30	67.60	58.70	65.85	69.10	66.33	61.45	57.29	67.50	71.00	71.78	64.92
Cubic feet per ton of Sugar (all Masseccuites) .. .. .	59.14	58.61	53.91	51.97	—	51.44	—	53.18	50.43	57.36	46.57	53.29	—	45.33	—	48.72	—	—	—	53.17

**SECOND MASSECUITE—**

Brix .. .. .	94.93	97.09	93.30	97.12	93.32	97.11	92.21	95.60	96.55	94.50	96.88	91.41†	94.95	97.83	95.20	94.79	93.65	94.00	94.67	95.08
Purity (apparent) .. .. .	79.96	65.48	70.40	69.40	79.40	69.50	72.42	70.20	67.50	70.56	68.60	73.90	66.30	68.87	66.00	69.35	61.60	75.10	74.48	72.14
Purity of Run-off .. .. .	57.99	—	48.20	45.40	60.10	47.90	53.95	44.90	44.30	49.08	45.50	52.65	50.20	41.89	45.98	49.57	48.50	50.00	54.28	51.05

**THIRD MASSECUITE—**

Brix .. .. .	98.94	—	—	97.65	94.94	98.21	—	96.70	—	94.67	—	91.12†	—	98.82	96.00	—	—	96.80	96.30	96.27
Purity (apparent) .. .. .	68.47	—	—	57.70	67.80	63.40	—	58.40	—	64.38	—	65.96	—	56.18	58.11	—	—	60.50	64.36	64.55
Purity of Run-off .. .. .	45.14	—	—	39.30	44.20	43.60	—	37.98	—	44.48	—	46.86	—	36.09	40.18	—	—	38.90	—	43.36

**JELLY—**

Brix .. .. .	—	—	—	—	94.63	95.80	90.44	—	96.46	92.91	92.66	83.92†	92.14	—	—	90.92	92.30	—	—	92.69
Purity (apparent) .. .. .	—	—	—	—	45.10	46.80	54.59	—	44.40	49.95	45.70	49.03	48.40	—	—	49.78	48.50	—	—	47.36

**FINAL MOLASSES—**

Brix .. .. .	87.90	88.05	83.20	83.50	89.95	78.19†	87.50	91.00	90.15	86.80	85.98	82.44†	88.69	92.18	89.00	84.55	81.88	87.90	84.03	86.38
Purity (Clarget) .. .. .	45.68	44.49	44.39	40.00	39.80*	48.40	47.80	38.40*	40.70*	44.48*	43.60	45.28	46.00*	36.36	40.18*	43.03*	43.90*	38.90*	43.92*	43.45
Weight per cent. Cane at 85.0° Brix .. .. .	2.67	3.10	2.44	3.10	—	3.24	3.20	2.58	—	—	3.67	—	—	—	—	—	3.86	—	2.92	3.13

**POLARIZATION OF SUGARS—**

White .. .. .	99.90	99.55	—	99.90	—	—	—	—	—	99.83	—	—	99.80	—	99.71	99.80	99.84	—	99.81	99.87
Government Grade .. .. .	97.94	97.93	—	—	98.70	98.15	—	98.46	98.94	98.91	98.84	98.49	98.91	—	98.60	98.42	—	—	98.89	98.34
Raw .. .. .	97.94	97.87	—	98.26	98.22	97.43	96.00	98.46	98.97	98.33	98.68	98.64	98.49	98.64	97.52	98.42	98.22	98.78	98.87	98.28
Average of all Sugars .. .. .	99.43	97.89	98.78	99.35	98.22	98.01	96.00	98.46	98.96	99.24	96.68	98.59	99.04	98.64	97.60	98.42	99.17	98.78	99.28	98.58
SO <sub>2</sub> in parts per million .. .. .	17.20	63.80	—	61.70	—	69.90	—	60.00	44.00	45.39	52.00	64.00	—	87.00	52.00	—	37.22	56.00	42.89	50.86

**VARIETIES CRUSHED—**

Uba per cent. .. .. .	19.80	2.19	1.83	14.70	20.10	3.77	9.17	30.42	3.81	28.67	24.15	8.25	37.04	23.88	12.82	17.93	47.72	30.55	15.85	16.57
Co.281 per cent. .. .. .	32.00	27.88	68.77	40.57	44.33	59.56	34.63	35.83	45.04	38.37	46.32	49.65	38.87	42.24	44.45	38.98	21.57	57.85	43.52	42.44
Co.290 per cent. .. .. .	39.20	5.81	21.92	32.01	24.28	17.56	51.95	28.53	30.28	28.18	21.90	28.82	21.42	20.74	39.39	34.21	23.66	4.96	36.28	26.51
Co.301 per cent. .. .. .	5.00	4.05	2.02	10.32	9.01	4.50	3.12	4.76	5.00	3.22	5.98	10.90	1.09	11.24	0.65	7.15	6.59	4.79	2.92	5.89
P.O.J.2725 per cent. .. .. .	4.00	60.07	5.41	2.40	2.28	14.61	1.13	0.46	15.87	1.56	1.65	2.38	1.58	1.90	2.69	1.73	0.46	1.85	1.43	8.59

**FACTORY NUMBER**

1	2	3	4	5	6	8	9	10	11	12	14	15	16	17	18	19	20	21	SEASON
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\* Apparent purity. † Brix by refractometer.

## COMPARATIVE RESULTS FOR RECENT YEARS.

COUNTRY .. .. .	NATAL										
YEAR .. .. .	1931.	1932.	1933.	1934.	1935.	1936.	1937.	1938.	1939.	1940.	1941.
<b>CANE—</b>											
Per cent. Sucrose .. .. .	13.84	13.48	13.88	11.88	13.65	13.30	13.92	13.64	13.41	13.19	14.00
Per cent. Fibre .. .. .	15.75	15.65	15.78	15.24	15.92	15.01	15.14	14.51	14.80	15.56	15.66
<b>JUICES—</b>											
Purity of First Crusher .. .. .	87.92	87.89	87.46	86.03	89.35	88.18	88.15	88.37	88.45	87.44	87.94
Purity of Mixed Juice .. .. .	85.27	85.30	84.92	84.02	86.49	85.43	85.60	86.36	86.46	85.34	85.67
Purity of last Roller Juice .. .. .	79.99	79.20	78.26	76.71	78.05	76.87	76.81	76.86	77.07	76.15	77.46
Purity of Syrup .. .. .	86.82	86.84	86.57	85.53	88.28	87.53	87.70	88.22	88.12	87.11	87.69
Drop in purity Crusher to Mixed Juice .. .. .	2.65	2.59	2.54	2.01	2.86	2.75	2.55	2.01	1.99	2.10	2.27
Drop in purity Crusher to last Roller .. .. .	7.93	8.69	9.20	9.32	11.30	11.31	11.34	11.51	11.38	11.29	10.48
Drop in purity Crusher to Syrup .. .. .	1.10	1.05	0.89	0.50	1.07	0.65	0.45	0.15	0.33	0.33	0.25
Increase in purity Mixed Juice to Syrup .. .. .	1.55	1.54	1.65	1.51	1.79	2.10	2.10	1.86	1.66	1.77	2.02
Reducing Sugar Ratio of Mixed Juice .. .. .	3.35	3.09	4.01	4.21	2.65	3.04	3.23	3.08	3.27	3.81	3.35
<b>JAVA RATIO .. .. .</b>	<b>76.92</b>	<b>76.99</b>	<b>77.27</b>	<b>78.66</b>	<b>76.24</b>	<b>77.44</b>	<b>77.43</b>	<b>78.87</b>	<b>78.70</b>	<b>77.94</b>	<b>77.74</b>
<b>BAGASSE—</b>											
Per cent. Sucrose .. .. .	4.22	3.83	3.71	3.05	3.48	3.40	3.40	3.30	3.11	3.02	3.03
Per cent. Moisture .. .. .	50.09	51.89	51.62	52.11	51.93	52.76	52.01	52.17	51.79	51.60	51.50
<b>EXTRACTION—</b>											
Imbibition % Cane .. .. .	27.86	29.66	30.45	30.25	33.04	32.40	31.84	31.70	31.28	32.59	34.76
Sucrose in Mixed Juice % Sucrose in Cane .. .. .	89.40	89.86	90.28	91.07	90.64	91.08	91.53	91.90	92.24	91.91	92.37
Reduced Extraction (based on 12.5% Fibre) .. .. .	91.90	92.19	92.59	92.90	92.94	92.78	93.22	93.18	93.62	93.72	94.13
Primary Juice loss .. .. .	56.70	54.65	51.88	49.67	49.43	50.71	47.47	47.73	44.67	43.93	41.12
<b>FILTER CAKE—</b>											
Per cent. Sucrose .. .. .	4.79	4.50	4.04	3.65	3.69	3.20	3.37	2.63	2.19	2.03	1.71
Weight % Cane .. .. .	5.01	5.41	5.18	5.07	5.01	4.71	4.75	4.74	4.78	5.12	5.63
<b>FINAL MOLASSES—</b>											
Purity .. .. .	45.04	45.06	44.92	42.58	46.00	43.89	43.69	43.12	42.67	42.91	43.45
<b>RECOVERY—</b>											
Sucrose % Cane lost in manufacture .. .. .	3.53	3.36	3.27	2.52	2.94	2.71	2.73	2.55	2.42	2.52	2.57
Sucrose in Sugar % Sucrose in Cane .. .. .	74.39	75.73	76.63	77.59	78.40	79.64	80.41	81.31	81.98	80.86	81.66
Reduced Overall Recovery (12.5% Fibre, 85° pur. Mixed Juice) .. .. .	76.18	77.34	78.67	80.14	78.76	80.73	81.33	81.16	81.89	82.07	82.61
Sucrose in Sugar % Sucrose in Mixed Juice .. .. .	83.27	84.27	84.88	85.20	86.52	87.44	87.85	88.48	88.88	87.98	88.40
Reduced Boiling House Recovery (based on 85° pur. Mxd. Juice) .. .. .	82.90	83.89	84.97	86.27	84.74	87.01	87.25	87.10	87.47	87.57	87.76
<b>YIELD—</b>											
Tons Cane per ton Sugar .. .. .	9.53	9.61	9.28	10.67	9.19	9.29	8.80	8.89	8.95	9.26	8.62
Tons Cane per ton Sugar of 96° Pol. .. .. .	9.33	9.40	9.03	10.40	8.96	9.06	8.58	8.66	8.73	9.03	8.39
<b>LOSSES—</b>											
Sucrose in Bagasse % Sucrose in Cane (A) .. .. .	10.86	10.14	9.72	8.93	9.36	8.92	8.47	8.10	7.76	8.09	7.63
Sucrose in Filter Cake % Sucrose in Cane (B) .. .. .	—	—	—	—	1.37	1.14	1.15	0.91	0.78	0.60	0.52
Sucrose in Molasses % Sucrose in Cane (C) .. .. .	—	—	—	—	—	—	—	—	—	—	—
Undetermined Sucrose % Sucrose in Cane (D) .. .. .	—	—	—	—	10.87	10.30	9.97	9.68	9.48	10.43	10.18
Sucrose lost in Boiling House % Sucrose in Cane (B)+(C)+(D) .. .. .	14.56	14.13	13.65	13.48	12.24	11.44	11.12	10.59	10.26	11.03	10.70
Sucrose in Total Losses % Sucrose in Cane (A)+(B)+(C)+(D) .. .. .	25.42	24.27	23.37	22.41	21.60	20.36	19.59	18.69	18.02	19.12	18.34
<b>SUGAR—</b>											
Average Polarization of all Sugars .. .. .	98.08	98.14	98.68	98.45	98.42	98.43	98.50	98.60	98.36	98.44	98.58



## COMPARATIVE RESULTS FOR RECENT YEARS.

COUNTRY .. .. .	MAURITIUS.		QUEENSLAND.		PUERTO RICO.		BRITISH GUIANA.		INDIA.	TRINIDAD.	LOUISIANA	
	YEAR .. .. .	1939.	1940.	1939.	1940.	1940.	1941.	1939.	1940.	1940/41.	1940.	1940.
<b>CANE—</b>												
Per cent. Sucrose .. .. .	12.71	13.29	15.88	16.04	12.79	13.27	12.38	12.19	12.18	13.40	9.82	
Per cent. Fibre .. .. .	13.00	12.60	11.56	11.58	13.36	13.19	13.03	13.18	16.18	14.34	13.06	
<b>JUICES—</b>												
Purity of First Crusher .. .. .	87.40	88.10	89.85	89.65	85.25	85.35	84.06	82.15	82.70*	85.75	79.44	
Purity of Mixed Juice .. .. .	84.60	85.30	—	—	82.61	82.70	—	—	80.45	83.55	—	
Purity of last Roller Juice .. .. .	73.50	74.50	78.76	78.26	—	—	—	—	71.08	75.76	—	
Purity of Syrup .. .. .	84.90	85.80	89.77	89.46	83.80	84.28	82.99	80.85	—	—	—	
Drop in purity Crusher to Mixed Juice ..	2.80	2.80	—	—	2.64	2.65	—	—	2.25	2.20	—	
Drop in purity Crusher to last Roller ..	13.90	13.60	11.09	11.39	—	—	—	—	11.62	9.09	—	
Drop in purity Crusher to Syrup .. .. .	2.50	2.30	0.08	0.19	1.45	1.07	—	—	—	—	—	
Increase in purity Mixed Juice to Syrup ..	0.30	0.50	—	—	1.19	1.58	—	—	—	—	—	
Reducing Sugar Ratio of Mixed Juice ..	4.20	4.00	—	—	—	—	—	—	—	8.02	—	
JAVA RATIO .. .. .	79.04	79.51	83.45	83.41	79.29	79.37	81.87	81.49	77.53	78.00	78.19	
<b>BAGASSE—</b>												
Per cent. Sucrose .. .. .	2.60	2.62	2.98	2.92	2.56	2.65	3.59	3.71	3.19	3.28	3.07	
Per cent. Moisture .. .. .	44.70	44.60	49.63	49.88	48.03	48.28	46.22	46.27	—	47.73	48.94	
<b>EXTRACTION—</b>												
Imbibition % Cane .. .. .	20.49	20.78	—	—	24.68	25.76	24.43	23.72	19.79	24.85	15.00	
Sucrose in Mixed Juice % Sucrose in Cane ..	94.90	95.20	95.34	95.46	94.26	94.30	92.29	91.78	91.22	92.68	91.30	
Reduced Extraction (based on 12.5% Fibre)	95.10	95.20	94.91	95.05	94.68	94.64	92.65	92.26	93.43	93.75	91.73	
Primary Juice loss .. .. .	34.13	33.30	35.65	34.67	37.22	37.51	51.46	54.15	45.48	43.73	57.92	
<b>FILTER CAKE—</b>												
Per cent. Sucrose .. .. .	7.30	7.30	2.98	2.93	2.60	2.48	5.09	5.56	3.56	4.20	3.93	
Weight % Cane .. .. .	1.61	1.56	3.10	3.42	2.31	2.42	1.66	1.84	3.47	2.22	2.09	
<b>FINAL MOLASSES—</b>												
Purity .. .. .	39.70	39.70	36.51	36.39	31.69	30.67	31.27	33.41	32.95	31.71	—	
<b>RECOVERY—</b>												
Sucrose % Cane lost in manufacture .. .. .	2.06	2.01	2.11	2.03	1.67	1.72	2.24	2.60	2.49	2.12	2.05	
Sucrose in Sugar % Sucrose in Cane .. .. .	83.80	84.86	86.70	87.34	86.94	87.04	81.89	78.69	79.58	84.18	79.15	
Reduced Overall Recovery (12.5% Fibre, 85° pur. Mixed Juice)	84.45	84.68	—	—	88.52	88.50	—	—	85.04	86.02	—	
Sucrose in Sugar % Sucrose in Mixed Juice ..	88.40	89.14	90.94	91.49	92.23	92.31	88.73	85.74	87.22	90.83	86.69	
Reduced Boiling House Recovery (based on 85° pur. Mxd. Juice)	88.80	88.95	—	—	93.49	93.51	—	—	90.92	91.75	—	
<b>YIELD—</b>												
Tons Cane per ton Sugar .. .. .	9.26	8.61	7.15	7.03	8.72	8.40	9.50	10.04	10.29	8.58	—	
Tons Cane per ton Sugar of 96° Pol. .. .. .	9.01	8.39	6.97	6.85	8.63	8.31	9.47	10.01	9.90	8.51	12.35	
<b>LOSSES—</b>												
Sucrose in Bagasse % Sucrose in Cane (A) ..	5.10	4.80	4.66	4.54	5.55	5.50	7.71	8.27	8.78	7.32	8.70	
Sucrose in Filter Cake % Sucrose in Cane (B) ..	0.92	0.86	0.58	0.63	0.47	0.45	0.68	0.84	0.79	0.59	0.84	
Sucrose in Molasses % Sucrose in Cane (C) ..	—	—	5.12	5.30	6.72	6.63	6.94	8.91	9.68	7.11	9.87	
Undetermined Sucrose % Sucrose in Cane (D) ..	10.18	9.48	2.94	2.19	0.32	0.38	2.78	3.29	1.17	0.80	1.44	
Sucrose lost in Boiling House % Sucrose in Cane (B)+(C)+(D)	11.10	10.34	8.64	8.12	7.51	7.46	10.40	13.04	11.64	8.50	12.15	
Sucrose in Total Losses % Sucrose in Cane (A)+(B)+(C)+(D)	16.20	15.14	13.30	12.66	13.06	12.96	18.11	21.31	20.42	15.82	20.85	
<b>SUGAR—</b>												
Average Polarization of all Sugars .. .. .	98.70	98.50	98.52	98.46	96.99	97.03	96.31	96.26	99.75	96.76	—	

\* Primary juice.

## YIELDS OF CANE HARVESTED BY DISTRICTS (EUROPEAN PLANTERS ONLY).

COMPILED FROM UNION DEPARTMENT OF CENSUS RETURNS.

DISTRICT.	YIELD OF CANE IN TONS.										
	1930.	1931.	1932.	1933.	1934.	1935.	1936.	1937.	1938.	1939.	1940.
PORT SHEPSTONE.. . . . .	68,770	60,231	81,823	64,018	67,974	59,259	56,685	75,028	74,856	89,585	81,811
UMZINTO .. . . . .	449,410	486,803	638,701	598,308	611,231	553,401	564,427	692,159	663,609	744,981	733,332
DURBAN AND PINETOWN .. . . . .	164,849	136,979	159,020	138,096	185,118	137,805	146,676	124,109	188,183	213,958	193,938
<b>Total South of Umgeni River</b> .. . . . .	683,029	684,013	879,544	800,422	864,323	750,465	767,788	891,296	926,648	1,048,524	1,009,081
Ratio to 1926 (= 100).. . . . .	153.2	153.4	197.3	179.54	193.9	168.3	172.2	199.9	207.9	235.2	226.3
INANDA .. . . . .	414,466	375,763	455,816	504,540	618,853	672,954	629,945	615,227	683,261	807,094	816,215
LOWER TUGELA .. . . . .	873,467	648,693	754,022	829,067	1,012,784	1,033,633	1,184,839	1,138,342	1,122,528	1,285,888	1,299,769
<b>Total for North Coast between Umgeni and Tugela Rivers</b> .. . . . .	1,287,933	1,024,456	1,209,838	1,333,607	1,631,637	1,706,587	1,814,784	1,753,569	1,805,789	2,092,982	2,115,984
Ratio to 1926 (= 100).. . . . .	155.5	123.7	146.1	161.00	197.0	206.1	219.1	211.7	218.0	252.7	255.5
<b>Total for Natal South of the Tugela (excluding Zululand)</b> .. . . . .	1,970,962	1,708,469	2,089,382	2,134,029	2,495,960	2,457,052	2,582,572	2,644,865	2,732,437	3,141,506	3,125,065
Ratio to 1926 (= 100).. . . . .	154.7	134.1	164.0	167.51	195.9	192.9	202.7	207.6	214.5	246.6	245.3
MTUNZINI .. . . . .	434,124	331,561	360,130	353,287	414,821	403,121	413,802	435,154	462,271	525,787	507,644
ESHOWE .. . . . .	146,256	109,525	105,836	120,099	130,104	128,191	120,935	151,020	193,847	243,829	240,962
LOWER UMFOLOZI .. . . . .	580,925	426,516	525,498	582,636	489,547	496,591	616,326	713,675	703,527	777,371	765,381
HLABISA .. . . . .	110,840	59,657	74,379	80,552	63,866	50,529	74,276	136,249	140,794	155,775	158,176
<b>Total North of the Tugela (Zululand)</b> .. . . . .	1,272,145	927,259	1,065,813	1,136,574	1,098,338	1,078,432	1,225,339	1,436,098	1,500,439	1,702,762	1,672,163
Ratio to 1926 (= 100).. . . . .	140.0	102.0	117.3	125.08	120.9	118.7	134.8	158.0	165.1	187.4	184.0
<b>GRAND TOTAL FOR NATAL (including Zululand)</b> .. . . . .	3,243,107	2,635,728	3,155,195	3,270,603	3,594,298	3,535,484	3,807,911	4,080,963	4,232,876	4,844,268	4,797,228
Ratio to 1926 (= 100).. . . . .	148.6	120.8	144.6	149.85	164.7	162.0	174.5	187.0	193.9	221.9	219.8

## YIELDS OF CANE HARVESTED BY DISTRICTS (EUROPEAN PLANTERS ONLY).

COMPILED FROM UNION DEPARTMENT OF CENSUS RETURNS.

DISTRICT.	PER CENT. OF TOTAL TONNAGE.												
	1928.	1929.	1930.	1931.	1932.	1933.	1934.	1935.	1936.	1937.	1938.	1939.	1940.
PORT SHEPSTONE .....	1.8	1.9	2.1	2.3	2.6	2.0	1.9	1.7	1.5	1.8	1.8	1.8	1.7
UMZINTO .....	17.8	17.8	13.9	18.5	20.2	18.3	17.0	15.6	14.8	17.0	15.7	15.4	15.3
DURBAN AND PINETOWN .....	4.7	4.8	5.1	5.2	5.0	4.2	5.1	3.9	3.9	3.0	4.4	4.4	4.0
<b>Total South of Umgeni River</b> .....	24.3	24.6	21.1	26.0	27.9	24.5	24.0	21.2	20.2	21.8	21.9	21.6	21.0
INANDA .....	13.3	14.8	12.8	14.3	14.4	15.4	17.2	19.0	16.5	15.1	16.2	16.7	17.0
LOWER TUGELA .....	24.8	24.5	26.9	24.6	23.9	25.3	28.2	29.2	31.1	27.9	26.5	26.5	27.1
<b>Total for North Coast between Umgeni and Tugela Rivers</b> .....	38.1	39.3	39.7	38.9	38.3	40.8	45.4	48.3	47.6	43.0	42.7	43.2	44.1
<b>Total for Natal South of the Tugela (excluding Zululand)</b> .....	62.4	63.9	60.8	64.8	66.2	65.2	69.4	69.5	67.8	64.8	64.6	64.8	65.1
MTUNZINI .....	13.4	12.5	13.4	12.6	11.4	10.8	11.6	11.4	10.9	10.7	10.9	10.9	10.6
ESHOWE .....	3.5	2.7	4.5	4.2	3.4	3.7	3.6	3.6	3.2	3.7	4.6	5.0	5.0
LOWER UMFOLOZI .....	18.3	18.6	17.9	16.2	16.7	17.8	13.6	14.1	16.2	17.5	16.6	16.0	16.0
HLABISA .....	2.5	2.4	3.4	2.3	2.4	2.5	1.8	1.4	1.9	3.3	3.3	3.2	3.3
<b>Total North of the Tugela (Zululand)</b> .....	37.6	36.1	39.2	35.2	33.8	34.8	30.6	30.5	32.2	35.2	35.4	35.1	34.9
<b>GRAND TOTAL FOR NATAL (including Zululand)</b> .....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

## YIELDS OF CANE HARVESTED BY DISTRICTS (EUROPEAN PLANTERS ONLY).

COMPILED FROM UNION DEPARTMENT OF CENSUS RETURNS.

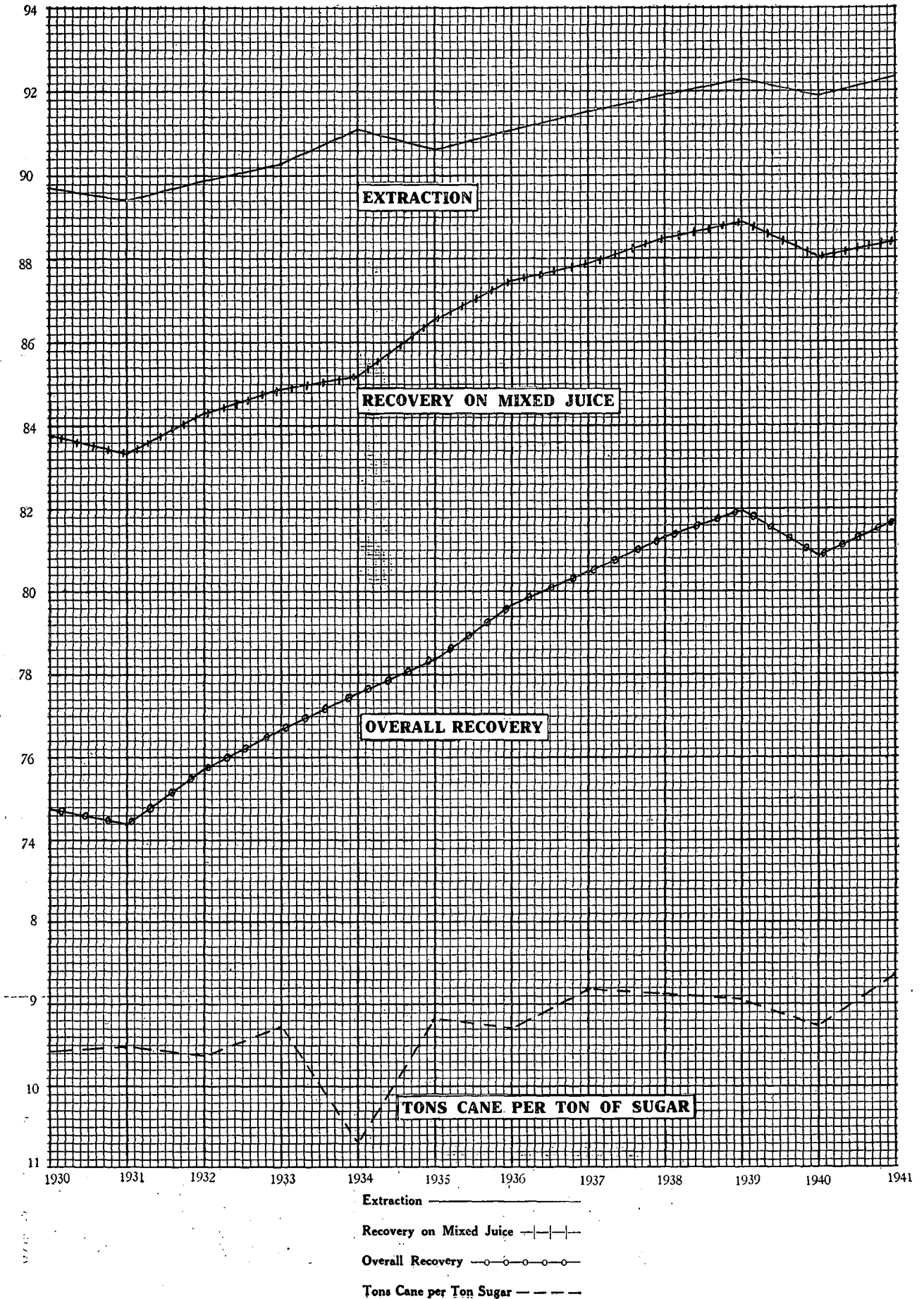
DISTRICT.	TONS CANE PER ACRE.												
	1928.	1929.	1930.	1931.	1932.	1933.	1934.	1935.	1936.	1937.	1938.	1939.	1940.
PORT SHEPSTONE.. . . . .	19.98	17.40	18.60	18.80	19.57	20.47	16.34	14.78	13.51	21.53	29.33	26.52	18.15
UMZINTO .. . . . .	19.33	20.10	22.30	20.80	22.24	21.68	20.69	18.20	18.22	22.41	23.50	25.94	23.02
DURBAN AND PINETOWN .. . . . .	22.64	24.80	26.77	22.90	21.75	23.00	23.34	20.27	19.77	20.42	27.65	31.76	24.74
<b>Total South of Umgeni River</b> .. . . . .	19.77	20.60	22.76	21.00	21.87	21.79	20.76	18.21	18.02	22.04	24.65	27.00	22.83
Ratio to 1926 (= 100).. . . . .	107.20	111.70	123.40	114.10	118.60	118.17	112.58	98.75	97.72	119.52	133.68	146.42	123.81
INANDA .. . . . .	18.45	20.50	22.01	19.20	20.14	22.80	25.90	26.76	25.95	26.19	31.27	36.57	33.24
LOWER TUGELA .. . . . .	20.08	20.80	22.12	18.20	18.36	19.45	21.62	20.83	22.61	22.90	25.19	29.51	27.35
<b>Total for North Coast between Umgeni and Tugela Rivers</b> .. . . . .	19.48	20.68	22.08	18.60	18.99	20.59	23.07	22.83	23.67	23.96	27.19	31.89	29.35
Ratio to 1926 (= 100).. . . . .	104.70	111.10	118.10	100.00	102.00	110.64	123.97	122.68	127.19	128.75	146.10	171.36	157.71
<b>Total for Natal South of the Tugela (excluding Zululand)</b> .. . . . .	19.59	20.65	22.31	19.40	20.11	21.03	22.21	21.19	21.65	23.27	26.27	30.07	26.87
Ratio to 1926 (= 100).. . . . .	105.60	111.30	120.30	104.60	108.40	113.37	119.73	114.23	116.71	125.44	141.62	162.10	144.85
MTUNZINI .. . . . .	20.84	20.70	22.53	18.10	17.55	18.40	19.56	18.75	18.85	20.97	24.67	27.86	27.06
ESHOWE .. . . . .	22.76	20.60	20.22	18.90	16.69	17.47	17.95	17.64	17.26	20.69	28.03	29.89	26.62
LOWER UMFOLOZI .. . . . .	22.99	21.60	23.83	18.00	18.63	19.84	17.93	18.28	23.04	28.81	34.40	33.25	31.00
HLABISA .. . . . .	18.58	17.80	19.55	14.60	16.17	17.31	14.79	12.72	18.60	25.36	30.91	28.81	29.60
<b>Total North of the Tugela (Zululand)</b> .. . . . .	21.83	20.92	22.50	17.90	17.86	18.91	18.28	18.00	20.52	24.68	29.62	30.51	28.91
Ratio to 1926 (= 100).. . . . .	91.60	87.80	94.40	75.20	74.95	79.35	76.71	75.54	86.11	103.57	124.30	128.03	121.32
<b>GRAND TOTAL FOR NATAL (including Zululand)</b> .. . . . .	20.38	20.75	22.39	18.90	19.29	20.24	20.84	20.10	21.27	23.75	27.37	30.22	27.55
Ratio to 1926 (= 100).. . . . .	99.70	101.50	109.50	92.60	94.40	99.02	101.96	98.34	104.06	116.19	133.90	147.85	134.78
Rainfall of all Districts (inches) <i>(Average from 44 centres).</i> .. . . . .	—	48.30	37.20	29.39	48.20	31.12	44.60	46.12	50.10	39.48	40.38	47.63	43.37

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

COMPILED FROM UNION DEPARTMENT OF CENSUS RETURNS.

DISTRICT.	TONS CANE PER ACRE, 1940/41		PERCENTAGE (AREA) OF NON-UBA CANES UNDER CULTIVATION. APRIL 30TH.							ACREAGE UNDER CULTIVATION. APRIL 30TH. PLANT CANE.		Total Plant Cane, 1941, % Total Plant Cane, 1940.
	Uba.	Non-Uba.	1935.	1936.	1937.	1938.	1939.	1940.	1941.	1940.	1941.	
PORT SHEPSTONE .. .. .	13.03	22.24	4.4	19.5	36.3	48.8	56.4	70.6	86.6	1,381	1,963	142.1
UMZINTO .. .. .	19.28	25.20	10.3	23.4	40.8	50.3	56.4	59.9	70.3	6,143	9,447	153.8
DURBAN AND PINETOWN .. .. .	19.39	26.70	12.1	30.2	48.9	67.4	76.5	81.7	85.4	3,228	3,501	108.5
<b>Total South of Umgeni River..</b>	18.51	25.24	10.0	24.0	41.4	53.0	60.0	64.7	74.7	10,752	14,911	138.7
Ratio to 1926 (= 100).. .. .	100.38	136.88	—	—	—	—	—	—	—	—	—	—
INANDA .. .. .	26.34	36.43	14.3	24.6	36.4	49.4	59.8	69.7	77.7	12,218	11,175	91.5
LOWER TUGELA .. .. .	20.91	30.14	16.5	32.3	45.5	55.3	64.1	71.0	77.5	17,949	20,696	115.3
<b>Total for North Coast between Umgeni and Tugela Rivers..</b>	22.82	32.25	15.8	29.9	42.5	53.4	62.7	70.6	77.6	30,167	31,871	105.6
Ratio to 1926 (= 100).. .. .	122.62	173.29	—	—	—	—	—	—	—	—	—	—
<b>Total for Natal South of the Tugela (excluding Zululand) .. .. .</b>	21.02	29.71	13.6	27.8	42.1	53.2	61.7	68.4	76.5	40,919	46,782	114.3
Ratio to 1926 (= 100).. .. .	113.32	160.16	—	—	—	—	—	—	—	—	—	—
MTUNZINI .. .. .	21.87	27.86	16.4	31.0	50.0	66.6	77.1	83.8	90.9	10,963	10,926	99.7
EŠHOWE .. .. .	19.78	27.49	8.7	22.1	49.6	67.5	79.3	89.0	93.8	6,118	5,967	97.5
LOWER UMFOLOZI .. .. .	19.71	32.09	20.0	40.6	61.1	73.1	83.0	89.3	94.0	12,246	12,490	102.0
HLABISA .. .. .	18.43	30.72	17.2	34.5	52.2	70.2	80.0	90.6	92.5	2,940	2,399	81.6
<b>Total North of the Tugela (Zululand) .. .. .</b>	20.50	29.92	17.2	34.5	55.1	69.9	80.2	87.5	92.8	32,267	31,782	98.5
Ratio to 1926 (= 100).. .. .	86.03	125.56	—	—	—	—	—	—	—	—	—	—
<b>GRAND TOTAL FOR NATAL (including Zululand) .. .. .</b>	20.95	29.79	14.9	30.1	46.5	58.8	67.9	74.8	82.1	73,186	78,564	107.3
Ratio to 1926 (= 100).. .. .	102.50	145.74	—	—	—	—	—	—	—	—	—	—
Average Rainfall of all Districts	43.37	43.37	—	—	—	—	—	—	—	—	—	—

EXTRACTION AND RECOVERY FIGURES, 1930/1941



EXTRACTION AND RECOVERY FIGURES AND  
 SUCROSE OF CANE, PURITY OF MIXED JUICE AND  
 FIBRE % CANE, BY MONTHS

