

ANNUAL SUMMARY OF CHEMICAL LABORATORY REPORTS FROM NATAL SUGAR FACTORIES, SEASON 1934-35.

By H. H. DODDS and J. C. KINLOCH.

The 1934-35 season was a very abnormal one for two main reasons, both affecting profoundly the quality of the sugar cane crop during the crushing season. One reason was the unusually abundant and prolonged summer rainfall. Although the rainfall for the 12 months ending June, 1934, was 39.62ins. which is only 8 per cent above the 48 year average for the district, the rainfall for the six months November to April was 32.10ins. which is 29 per cent above normal. Further, the rainfall for April, which normally marks the end of the rainy season and the beginning of the ripening of the cane and has an average rainfall of 2.69ins., was no less than 6.61ins.; the rainfall for May was also above normal. Consequently the cane could not ripen and develop satisfactory sucrose content for manufacture until relatively late in the season.

An inspection of records of recent years shows that there is a very definite relationship between the total rainfall for the April-June quarter and the average sucrose content for the crop, as an appended graph illustrates. Unusually abundant late rains in every case have had a marked effect in delaying the ripening of the crop beyond the time when much of it has already been cut, thus reducing the average sucrose content of cane for the season as a whole. This effect has never been so pronounced as in the year under review.

Incidentally, the above contains a hint to the irrigator not to irrigate cane after the end of March more than the minimum that may be necessary over and above the rainfall to preserve the health of the plant during the ripening period.

Another very important factor affecting the development of the cane during the past season was the locust plague. In many districts the crops were eaten off repeatedly, first by flying locusts and later by the new generation of hoppers.

Such cane naturally never had the chance to develop a normal sucrose content, photosynthesis of carbohydrate being checked for long intervals after the leaves had been destroyed, until a new leaf system had been formed.

The result was that in the early part of the season it was very difficult in the infested districts to find cane that would contain even the minimum content of sucrose (9 per cent) permissible under the Fahey agreement. Up to the end of December as much as 137,787 tons of cane or 6.2 per cent of the total were below the rejection point of 9 per cent sucrose, by far the highest figures for rejection cane ever recorded. The planters sending in this cane received a voluntary payment from the manufacturers, usually 6/- per ton.

Later in the season a large proportion of one-year old cane of low sucrose content that had been damaged by locusts was sent to the mill in the belief that such cane would not resume normal growth or even develop satisfactory sucrose content. This supposition was probably well-founded where the growing tip of the cane had been damaged, which would promote a tendency towards side-shooting, which has many disadvantages. This tendency is particularly noticeable with Uba cane, and is much less evident with the new varieties in cultivation such as Co. 281, Co. 290 and P.O.J. 2725, which recover from locust damage in a more normal way.

The result of this premature harvesting of damaged cane was that the total crop was increased at the expense of next year's crop, but that the sucrose yield per unit of cane was still further adversely affected.

The average sucrose content of the cane for the season was 11.88 per cent which is 2.00 lower than that of the 1933-34 season, and by far the lowest on record.

In certain other respects also the quality of the cane was much below the normal of previous years. The purities of first crusher juice, 86.03, and mixed juice 84.02 are the lowest on record and the reducing sugar ratio in mixed juice, 4.21, the highest.

The fibre content of the cane, 15.24 per cent, on the other hand, is the lowest recorded for any year, probably due to the large proportion of one-year old cane harvested for reasons already mentioned.

A largely increased tonnage of soft canes was milled, nearly 50,000 tons, although these canes were still mostly used for replanting. It seems probable that next season will show for the first time a material proportion of such canes in the crop.

The average sucrose content of these canes, comprising P.O.J. 2725, 2714, 2878, 2727 and Co. 290, was for the season 14.26 per cent, or 2.40 per cent higher than the Uba. Further data regarding their field and factory performance are being collected and will form the subject of another report.

Although the general quality of the crop was much below normal except for the reduced fibre content, the mill extraction and factory recovery figures continue the advance shown in recent years. The extraction (sucrose in juice per cent of sucrose in cane) 91.07, recovery on mixed juice (sucrose in sugar per cent of sucrose in juice, known internationally as boiling house recovery), 85.20, and overall recovery (sucrose in sugar per cent of suc-

rose in cane) 77.59, are all higher than for any previous year. These figures may be considered very creditable for a crop consisting almost entirely of Uba, of the refractory qualities that this variety of cane develops, more especially in a sub-tropical climate.

The total output for the season is 3,878,079 short tons (3,518,170 metric tons) of cane (estimated) milled and 358,738 short tons (325,445 metric tons) of sugar manufactured. Of this cane 2,225,735 short tons, or 57.39 per cent of the total, are grown by planters who sell the cane to the manufacturer, the balance of 42.61 per cent being grown by the manufacturers themselves.

According to Dr. G. Mikusch's estimates as published in "Facts About Sugar" for January, 1935, the total estimated world crop for the 1934-35 season is 26,061,000 metric tons, of which the South African total forms 1.25 per cent, or 4.5 per cent of the total sugar produced within the British Commonwealth.

Of the total South African output of sugar of 358,738 short tons, 346,222 short tons or 96.5 per cent are represented in our returns. This includes all the 17 factories known to have complete chemical control, the balance representing six small factories believed not to have complete chemical control.

The proportions of total output represented in our returns to date are as follows:—

Season.	No. of factories reporting.	No. of factories in operation.	Per cent of total output represented in returns.
1925/26	11	25	60.4
1926/27	13	23	73.3
1927/28	14	21	81.0
1928/29	14	25	83.3
1929/30	16	25	91.0
1930/31	17	23	94.9
1931/32	16	22	94.5
1932/33	16	23	94.4
1933/34	15	23	90.0
1934/35	17	23	96.5

A few new figures are included this year, arising out of certain suggestions by Noel Deerr (International Sugar Journal, vol. 35, 1933, page 214) and recommended for consideration by the International Society of Sugar Cane Technologists.

These proposals are to reduce the extraction and recovery figures to a common standard basis of 12.50 per cent fibre and 85 purity of mixed juice. This "Reduced Extraction" requires the calculation of the "lost primary juice" which is therefore also included in our returns, as explained in the report of the Committee on Standardization of Chemical Control.

The Reduced Extraction, Reduced Boiling House Recovery, and Reduced Overall Recovery figures,

as well as the "lost primary juice," should permit more accurate comparisons to be made between our own factories, at least as long as they are crushing in the main the same variety of cane. For reasons explained in the committee report just mentioned, the comparisons can hardly be so accurate where different types of cane are involved.

However, results from this country are tabulated with others for comparison, and show our returns in a somewhat more favourable light for an industry using almost entirely Uba cane.

Considering the season by periods, we also find some unusual relations. The peak of sucrose content of cane came during the September/November period, or almost two months later than normal, for reasons already discussed. But although there was the usual falling off in sucrose content and general quality of cane in December, this was only slightly reflected in reduced extraction and not at all in reduced recovery which continued to increase up to the end of the season. This may be partly accounted for, however, by certain factories closing down before the December period, and the absence of their returns affecting the general averages as compared with preceding periods.

Although the season began later than usual, very little cane being crushed before the beginning of June, we again find that cane cut during June compares unfavourably in sucrose and fibre contents and in manufacturing results from it with cane cut later in the season.

Turning to the performance of individual factories we find that in quality of cane crushed No. 1 factory leads in sucrose content of cane with 12.96 per cent, the lands surrounding this factory having been but little invaded by locusts until late in the year. No. 16 also was supplied with cane of sucrose content much above the average, associated with relatively low fibre content and juice of high average purity and low reducing sugar content.

No. 1 factory gained the highest extraction, 94.20, the highest reduced extraction, 95.41, the highest overall recovery, 82.49, and the highest reduced overall recovery, 83.73; also the lowest ratio of cane to sugar, both actual, 9.29, and based on sugar of 96°, 8.99, while maintaining the high average polarization of all sugars of 99.24, most of the output being of refined grade. The mean tonnage of cane crushed per hour was 109.43 which is by far the highest for any single train of mills in this country, although surpassed by some of the huge milling plants in Cuba, crushing a softer cane. The output of sugar from No. 1 factory is the highest for the season, 48,818 short tons (44,287 metric tons).

The best recovery on mixed juice (sucrose in sugar per cent of sucrose in juice) known internationally as boiling house recovery is shown by factory No. 16, 88.43; but owing to relatively high losses of sucrose in bagasse at this factory, the extraction and consequently the overall recovery are not conspicuously high.

The highest rate of crushing is again recorded by factory No. 5, having two tandems, with a total average for the season of 120.50 tons (109.32 metric tons) of cane per hour. This factory is second in output of sugar with 46,500 short tons (42,185 metric tons) and first in throughput of cane, 464,618 short tons (421,499 metric tons). This is the largest quantity of cane ever crushed by any South African factory in one season.

The best recovery efficiency (sucrose in sugar per cent of available sucrose in mixed juice) is recorded by factory No. 10, 102.36, a factory having one of the lowest mixed juice purities and a final molasses purity of 40.90 considerably below the purity of 45 assumed for final molasses in the modification of the s.j.m. formula in use in this country.

Previous to this season No. 1 factory was the only one to gain an overall recovery of over 80, but

it is joined this season by factory No. 20 which is second in this respect with an overall recovery of 81.59.

On the reduced overall recovery the average for the country is over 80, nine out of the 17 factories passing that mark.

There is no change in the identity of the numbers allotted to the factories. Of the numbers missing from the table, 3, 7 and 13 represent factories that have closed down during recent years, and No. 17 was at one time given to a small factory which, it is understood, does not now have complete chemical control.

In conclusion, the season records a further gratifying increase in factory performance, notwithstanding the abnormally low sucrose content of the cane.

The writers desire to express their appreciation of the freedom with which the fullest available information was supplied from every factory able to do so.

APPENDIX.

FIELD RETURNS 1933/34 CROP—COMPILED FROM THE UNION DEPARTMENT OF CENSUS STATISTICS FOR SUGAR CANE AGRICULTURE (European Planters Only).

The Special Census of Sugar Cane Plantations, 1933/34 (Uba Variety) as usual provides interesting comparisons between the results of different seasons and from different districts.

The area of variety canes other than Uba recorded harvested during the 1933/34 season was the almost negligible quantity of 309 acres, of which 201 acres were in the Lower Tugela division, no other division recording more than 45 acres. The average yield of cane per acre was 29.5 short tons (26.8 metric tons), or 46 per cent more than the average yield from Uba cane.

The total area of Uba cane harvested by European planters during the 1933/34 season, 161,577 acres was 2,000 acres less than the record area harvested in 1932/33, but the yield of cane, 3,270,603 short tons (2,967,072 metric tons) was the highest on record and is nearly 50 per cent greater than that for 1926. The slightly improved yield of cane per acre, 20.24 short tons (18.36 metric tons), due to the central North Coast and Zululand areas (not the South Coast), can no doubt be attributed to the abnormally high general rainfall of 50.85 ins. for 1932 (24 per cent above the general six year average of 41.01 ins.), although the rainfall for 1933, 31.77 ins. was equally below the average.

The fact that there has been no general increase in yield of Uba cane over recent years, notwithstanding better agricultural practice and increased use of fertilizers, is probably largely due to the effect of the spread of Streak disease.

This view is confirmed by the fact that the yield has decreased progressively in those areas where streak disease has most spread, such as Lower Tugela and Eshowe, and increased in Inanda where streak disease has been kept in check.

In this respect also therefore, the introduction of the streak-resistant varieties will prove a boon, though they will most probably bring their own special problems in turn.

The area of cane harvested and tonnage have tended to increase in the larger cane-growing areas such as Lower Tugela and Lower Umfolozi at the expense of the smaller districts, especially those of the South Coast such as Port Shepstone and Durban.

The largest yield of cane per acre is again shown by the small and decreasing Durban and Pinetown cane-growing area (which includes the alluvial fields of the Umlaas, Illovo and Umkomaas valleys), closely followed by Inanda, which was only

a few years ago the lowest. It is in the latter district that most progress has been made in irrigation.

The lowest yield per acre is, as usual, shown by the small cane-growing areas in the Hlabisa district (Hluhluwe, Mtubatuba, etc.) where the rainfall is, in the main, more than ordinarily deficient for sugar cane. Another district that has shown a considerable falling-off in yield of cane in recent years is Eshowe, though here the rainfall is considerably above the average. Much of the soil in this district is shallow, however, and there is a considerable falling-off in yield from plant and first ratoon to subsequent crops for that reason and probably also because of streak disease.

As mentioned in last year's report the yield of cane per acre is naturally affected by the age of the crop at harvesting. There may be a tendency in some districts to cut a larger proportion of the fields before they have had the normal full two season's growth, more than in others. Whether this difference is sufficient to affect materially comparisons of cane yields between different districts it is difficult to say. Certainly, as mentioned at the beginning of this paper, during the 1934/35 season an unusually large proportion of cane was harvested after only one season's growth, because of locust damage. For the present, therefore, until practice becomes more stabilised, we will no longer make any attempt to assess the yield of cane or sugar per acre per annum.

As last year there is a considerable difference between the total quantity of cane received at the factories for the 1933/34 season, estimated at 3,673,925 short tons (3,332,963 metric tons), and the total quantity of cane harvested by European planters for milling recorded by the Department of Census as 3,270,603 short tons (2,967,072 metric tons). This difference of 403,322 short tons (365,891 metric tons), or 10.98 per cent of the total represents no doubt the quantity of cane sent in by Native and Indian growers. This represents an increase in this proportion, which as estimated at 9.59 per cent for the 1932/33 season.

Experiment Station,
South African Sugar Association,
Mount Edgecombe,
Natal.

March, 1935.

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CHAIRMAN: This is the usual Annual Summary of the performances of the various factories for the past season. There is one point in it which most engineers will be very gratified to observe, that is the term "Reduced Extraction (based on Fibre of 12.5 per cent)." You will notice that our extractions have been all quite naturally raised by the adoption of this method of calculation, and I

think it is only fair that the fibre should be taken into consideration. Had this been introduced by Mr. Dodds or whoever is responsible, say five or ten years ago, when the Fahey Agreement was being brought out, I think most engineers would be carrying less grey hairs on their heads to-day! It is only giving credit where credit is due. We have a cane which is most difficult to mill as compared with the soft varieties of cane in other countries.

Mr. MOBERLY: Reference is made here to the reduced sucrose in cane damaged by locusts, and that has been the experience of all of us. It has been most marked, and I was interested in seeing an article in a Phillipine Journal a few months ago. I was surprised to find that over a large number of tests they found an increase in sucrose per cent cane in cane which had been damaged by locusts. Of course there was a falling off in yield of cane and falling off of sucrose per acre, but every time there was a definite increase of sucrose per cent cane. They definitely spoke of how to make the most of the increased sucrose when cane was damaged by locusts. I wonder if anyone can give any information on the cause of that.

Mr. DODDS: I certainly have noticed that difference but have not been able to suggest a satisfactory explanation of it.

CHAIRMAN: May I ask if any definite observations have been made as to the time taken after cane has been eaten by locusts before it recovers in sucrose. You say in your paper that there is a definite "dead" period until the leaves come forth again and the plant resumes its normal life. The locusts did not visit all parts of this country at one and the same time. The Southern districts of the sugar belt were affected by locusts much later in the season than the North, which I believe was eaten out mostly in the early part of the year, whereas the Southern districts were damaged in the months of May and June. There is a definite difference in the sucrose content throughout the season as regards the North and the South. We, who are on the South, have always been anxious to find out if possible how much of the difference has been due to the time of the year in which the locust damage occurred.

Mr. MOBERLY: In that connection I may say that at Sezela our staff carried out a series of experiments on four fields in that area. We took four fields selected in April and the cane was tested every week, and the tests were continued until various times of the year when the fields happened to be cut. The sucrose in them varied. The highest was 11%; a certain number dropped to about 8%. The curious thing noticed was that throughout the weeks we continued this experiment, although there were ups and downs, there was practically no permanent change, and when

these fields were cut at varying dates round about July and August they were practically the same as they were in April. The effect of the locusts in this area was apparently to stabilise the particular point it had reached in April. That was not obtained in general experience. Recoveries as a whole took place in other parts of the country, but in those four particular fields it was very marked that no noticeable change took place over the whole period of the remainder of their cane life.

Mr. DODDS: At the Experiment Station some canes were defoliated artificially in the same way that locusts would have done. We found the sucrose content was stationary for a considerable period depending on the time of the year, until the new leaf system had formed. If the defoliation took place late in the season then by the time recovery had taken place the next growing season had come about and there could be no recovery in sucrose content that season. In practice of course there were many cases where the cane was eaten down repeatedly, which gave the canes still less chance to recover. It is impossible to lay down any fixed period of recovery for the cane because of the effect of the season of the year on renewing growth.

Mr. BECHARD: There was another set of conditions in our case which followed the weather. Cane that had been locust eaten appeared to depreciate in sucrose slowly during the dry period and as soon as we got rain on it the sucrose came up as much as half a degree, then depreciation started again until the next shower. That was most noticeable at Amatikulu, and was quite the opposite to what took place in other years. With regard to "Primary Juice Loss," I would like to know how that figure was obtained. In our case I have some figures of primary juice, and I found it somewhat different from the first crusher analysis.

Mr. DODDS: The formula was the International formula for working out primary juice loss, that is $(I-e)(I-f) \div f$, where e is the extraction and f the fibre. The actual analysis of primary juice does not come into it at all.

Mr. DYMOND: Mr. Rault told us that increasing extraction up to 94 had given no reduction in recovery; that of course is associated with carbonation. But Mr. Dodds points out that the highest recovery recorded was that of factory No. 16, which was 88.43; he also stresses the fact that there was a relatively high loss in sucrose, in milling the actual extraction being only 89.37. It would be interesting to know if that factory would have obtained the same recovery under the defecation process with an extraction of 94 as made at Mount Edgecombe.

Mr. RAULT: I note with interest that you have adopted the reduced boiling house recovery as suggested by the International Society of Sugar Cane Technologists, by bringing juices to a common basis of 85 purity. This may be a fairer basis of comparison, but will not meet every case, as the purity figure is a measure of the total non-sugars but makes no allowance for the nature of the non-sugars. A mixed juice of 85 purity in South Africa and one of the same purity in Demerara are probably two different juices in their behaviour in the boiling house. The same may be said of juices from Uba and the new varieties. Even in this country with Uba we find that mixed juice of identical purities may be totally different in working qualities from one season to another. The past season is a typical example. In our district canes did not suffer seriously from locust attacks, but as a result of abundant late rains densities and consequently sucroses were exceptionally low. The purity of mixed juice was about the same as in previous years, but its working qualities were exceptionally good. Settling, filtering, boiling and airing operations being favourably influenced, the result was a better recovery than for previous years. This incident points out to the fact that the purity figure as determined by our usual methods, was not a true reflection of the availability of the sugar in the juices of the past season, which were more like those of canes grown under tropical conditions.

In answer to Mr. Dymond's remark about high extraction adversely boiling house recovery. Such has not been an experience at Mount Edgecombe as reported in my previous paper on milling results. Although we are helped by the thorough clarification method of double carbonation, yet we find that most of the other mills in South Africa who are not on carbonation, have all improved lately their milling without any detrimental action on recovery. No. 16 factory may not have a high mill extraction but this cannot be the explanation for its good boiling house results, as other mills with similar extraction do not obtain equally good boiling house work.

The low purity of final molasses reached in that factory upsets our past ideas of 40 as being the limit for Uba juice. Such low figures had occasionally been found when the original mixed juice was exceptionally low impurity and high in glucose ratio. In such a case the recovery was poor. Factory No. 16 starts with a comparatively high purity mixed juice and moderately low glucose ratio, but nevertheless exhaust its final molasses to 36.9 purity as a result of which the recovery is the best of all factories making cargo sugars.

I do not know all the factors that have contributed to this happy result, and I suggest that the Boiling House Committee should investigate with the idea of reproducing these conditions in other factories. Investigation on that line ought to be

very fruitful for the Industry, as we all realise that our heaviest losses in factory work, take place not only on milling but also in molasses, through the difficulty of lowering the purity of final molasses.

Mr. RAULT: Has not the time come for us to put the names of all the factories?

Mr. DODDS: Is your factory willing to cooperate?

Mr. RAULT: Yes, I am sure it is.

Mr. DODDS: I was under the impression that our usual practice would be followed of reading the

report of the Committee on Standardisation of Chemical Control before this discussion took place. That report deals with the points raised by Mr. Bechard concerning the calculation of lost primary juice and that by Mr. Rault concerning the unreliability of comparison based on a standard juice purity where different kinds of cane are concerned. Dealing with the other points raised, I agree that the results obtained by No. 16 and by other factories which show a molasses purity much below the average, should be carefully investigated, because undoubtedly it is in the molasses that our greatest source of loss exists.

FINAL MANUFACTURING RESULTS, NATAL SUGAR FACTORIES, SEASON 1934—35.

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	453,378	160,169	203,067	464,618	223,545	194,216	75,818	264,504	310,539	369,598	268,091	149,122	66,158	118,527	90,543	124,546	159,659	3,696,098
Cane crushed—metric tons	411,304	145,305	184,222	421,501	202,800	176,193	68,782	239,958	281,721	335,299	243,212	135,283	60,018	107,528	82,141	112,988	144,843	3,353,098
Tons of 2,000 lbs. Sugar bagged and estimated	48,818	12,010	19,920	46,500	20,890	19,560	6,890	22,000	23,962	36,450	24,150	13,450	6,721	10,620	8,002	13,043	13,256	346,242
Sugar bagged and estimated—metric tons	44,288	10,895	18,071	42,185	18,951	17,745	6,251	19,958	21,738	33,067	21,909	12,202	6,097	9,634	7,259	11,833	12,026	314,109
Tons Cane per ton of Sugar	9.29	13.33	10.19	9.99	10.70	9.92	11.00	12.02	12.96	10.14	11.10	11.09	9.84	11.16	11.31	9.55	12.04	10.67
Tons Cane per ton of Sugar calculated as Sugar of 96° Pol.	8.99	13.12	9.87	9.79	10.51	9.92	10.62	11.65	12.52	9.89	10.81	10.80	9.59	10.87	11.00	9.36	11.70	10.40
Time Crushing per cent. Available Time	96.42	67.14	94.93	93.59	88.27	88.96	85.30	81.24	90.10	88.16	83.57	93.86	86.95	92.49	83.12	94.67	96.03	88.52
Tons of 2,000 lbs. of Cane per hour Actual Crushing	109.43	61.32	52.64	120.50	84.48	49.16	22.10	76.76	90.60	93.69	68.73	40.85	23.04	32.52	26.70	32.22	49.17	60.82
Tons of 2,000 lbs. White Sugar made	—	—	12,200	—	—	19,418	6,757	—	—	—	—	8,111	—	—	—	—	—	—
Tons of 2,000 lbs. Raw Sugar made	—	—	7,700	—	—	142	133	—	—	—	—	5,339	—	—	—	—	—	—
Sucrose per cent. Cane	12.96	10.22	12.56	12.26	11.50	12.50	11.92	10.67	10.77	12.32	11.50	12.28	12.66	11.53	11.82	12.57	11.18	11.88
Fibre per cent. Cane	15.28	16.02	14.79	15.28	15.12	14.73	16.08	14.08	15.49	15.00	15.25	16.96	14.66	15.20	16.40	14.49	15.81	15.24
Java Ratio	79.87	79.87	78.83	79.71	77.21	79.20	—	76.86	80.10	77.11	77.88	77.72	80.18	77.34	76.15	79.81	77.97	78.66
Milling Loss	4.91	6.78	7.97	6.92	4.94	8.50	7.61	6.86	6.68	8.03	7.69	7.60	9.19	7.46	7.93	—	7.52	7.29
Extraction Ratio	0.38	0.67	0.63	0.56	0.43	0.68	0.64	0.64	0.62	0.65	0.67	0.62	0.72	0.65	0.67	0.50	0.67	0.61
Primary Juice Loss	32.16	55.93	54.04	47.90	36.55	58.06	53.54	55.22	52.16	55.36	56.68	51.41	61.88	54.84	56.07	42.37	56.60	49.67
Imbibition per cent. Cane	38.91	21.89	28.54	31.93	32.96	35.07	24.90	24.11	32.90	28.91	27.82	26.29	27.93	18.20	23.17	35.73	29.79	30.25
Extraction (Sucrose in Juice per cent. Sucrose in Cane) ..	94.20	89.33	90.62	91.36	93.49	89.97	89.74	90.95	90.44	90.23	89.80	89.50	89.37	90.17	89.00	92.82	89.37	91.07
Reduced Extraction (based on Fibre of 12.5 per cent.) ..	95.41	92.01	92.28	93.16	94.78	91.71	92.35	92.11	92.55	92.09	91.90	92.66	91.16	92.17	91.99	93.95	91.91	92.90
Sucrose per cent. Bagasse	2.19	3.09	3.51	3.11	2.16	3.55	3.57	3.10	3.14	3.08	3.46	4.14	3.26	3.61	2.84	3.30	3.05	3.05
Moisture per cent. Bagasse	52.29	50.31	51.03	51.19	53.24	53.75	48.80	57.44	49.37	52.66	54.41	50.21	49.80	52.08	49.86	50.69	51.88	52.11
Sucrose per cent. Cane lost in manufacture	2.27	2.91	2.84	2.46	2.37	2.83	2.89	2.43	3.11	2.62	2.61	—	2.65	2.77	3.10	2.31	2.97	2.52
Overall Recovery (Sucrose in Sugar % Sucrose in Cane) ..	82.49	71.54	77.43	79.98	79.37	77.29	75.79	77.19	71.17	78.75	77.27	72.44	79.03	76.00	73.77	81.59	73.39	77.59
Reduced Overall Recovery (based on Fibre of 12.5% and Mixed Juice Purity of 85.0%)	83.73	80.42	80.52	81.82	82.61	79.17	76.92	80.68	77.84	79.60	80.00	73.83	80.22	78.59	78.42	82.91	78.29	80.14
Recovery on Mixed Juice (Sucrose in Sugar % Sucrose in Juice	87.57	80.08	85.44	87.54	84.89	85.91	84.46	84.88	78.74	87.28	86.04	80.94	88.43	84.28	82.88	87.88	82.12	85.20
Reduced Boiling-House Recovery (based on Mixed Juice Purity of 85.0)	87.76	87.41	87.26	87.83	87.16	86.33	83.29	87.59	84.11	86.44	87.05	79.68	88.00	85.27	85.25	88.25	85.18	86.27
Available Sugar per cent. Sucrose in Juice	—	83.43	86.79	86.13	84.10	86.92	86.72	82.92	—	87.41	85.17	—	86.84	87.56	84.36	—	—	85.75
Recovery Efficiency (Sucrose in Sugar % Available Sucrose in Mixed Juice)	97.78	95.98	98.44	101.63	100.94	98.83	97.39	102.36	—	99.85	101.02	—	101.83	96.27	98.25	—	—	99.99
Sucrose in Bagasse per cent. Sucrose in Cane (A)	5.80	10.67	9.37	8.64	6.50	10.03	10.26	9.05	9.62	9.77	10.20	10.50	10.63	9.83	11.00	7.16	10.63	8.93
Sucrose in Filter Cake per cent. Sucrose in Cane (B)	0.46	1.73	1.84	1.02	2.65	1.56	1.93	1.31	—	1.34	1.66	1.01	—	—	—	1.19	1.40	—
Sucrose in Molasses per cent. Sucrose in Cane (C)	8.46	—	9.95	—	7.22	9.99	—	—	—	8.99	—	10.19	—	—	—	—	—	—
Undetermined Sucrose per cent. Sucrose in Cane (D)	2.79	16.06	1.41	10.36	4.26	1.13	12.02	12.44	19.21	1.15	10.87	5.86	10.34	14.17	15.23	10.06	14.58	—
Sucrose in Boiling House per cent. Sucrose in Cane (B)+(C)+(D)	11.71	17.79	13.20	11.38	14.13	12.68	13.95	13.75	19.21	11.48	12.53	17.06	10.34	14.17	15.23	11.25	15.98	13.48
Sucrose in total Losses per cent. Sucrose in Cane (A)+(B)+(C)+(D)	17.51	28.46	22.57	20.02	20.63	22.71	24.21	22.81	28.83	21.25	22.73	27.56	20.97	24.00	26.23	18.41	26.61	22.41
FIRST CRUSHER JUICE—																		
Brix	18.71	15.47	18.10	17.87	17.49	18.15	17.45	16.57	16.26	18.15	17.24	18.12	17.91	17.21	18.08	18.19	16.90	17.52
Purity (apparent)	86.70	82.70	88.00	86.10	85.20	86.99	88.30	83.80	82.60	88.00	85.60	87.20	87.45	86.61	85.80	86.60	84.86	86.03
LAST ROLLER JUICE—																		
Brix	1.88	5.73	3.78	3.55	3.32	4.82	6.60	4.48	4.52	4.45	4.48	4.02	5.39	6.53	6.61	2.80	5.12	4.59
Purity (apparent)	69.64	74.98	72.00	78.60	71.70	79.46	81.80	71.40	74.10	78.00	76.60	81.10	79.83	80.39	79.00	78.20	77.35	76.71
Purity drop from First Crusher	17.06	7.72	16.00	7.50	13.50	7.53	6.50	12.40	8.50	10.00	9.00	6.10	7.62	6.22	6.80	8.40	7.51	9.32

MIXED JUICE—																			
Brix	13.75	12.93	13.97	13.50	13.20	13.32	13.74	13.42	12.09	13.74	13.51	14.38	13.89	14.79	14.32	13.26	12.93	13.57	
Purity (Clerget)	3.61	6.01	3.76	3.99	5.30	2.62	—	5.63	5.07	3.53	4.48	2.63	3.40	3.66	3.95	4.01	5.78	4.21	
Reducing Sugar Ratio	—	—	2.880	—	—	—	—	—	—	3.530	3.033	—	—	—	—	—	—	3.148	
Purity drop from First Crusher.. .. .	1.90	1.26	2.30	1.40	2.40	2.38	2.40	1.50	1.70	2.20	1.58	1.40	1.99	2.46	2.80	2.00	2.41	2.01	
CLARIFIED JUICE—																			
Brix	13.47	12.80	14.03	—	13.45	12.86	13.70	11.25	12.32	12.35	11.90	14.44	12.36	14.71	16.33	13.64	12.42	13.25	
Purity (apparent)	88.84	82.95	86.90	—	84.00	86.24	87.50	83.40	82.00	87.10	85.90	85.00	86.23	84.71	84.60	86.40	83.98	85.36	
Reducing Sugar Ratio	1.88	5.21	—	—	4.59	2.55	—	4.86	—	3.28	4.43	2.49	—	—	3.35	3.46	4.56	3.70	
pH	6.75	—	7.17	—	7.30	7.60	6.80	7.40	—	7.60	7.89	—	7.46	—	—	7.46	6.90	7.30	
Per cent. Ash	—	—	—	—	—	—	—	—	3.52	—	2.99	—	—	—	3.15	—	—	3.22	
Parts SO ₂ per million of Brix	—	—	—	—	639	—	—	707	—	743	551	—	—	—	—	—	—	660	
FILTER CAKE—																			
Per cent. Sucrose	0.64	5.14	5.19	3.96	5.67	7.73	5.80	3.10	5.08	4.28	3.88	3.74	3.09	4.75	6.77	4.07	4.05	3.65	
Weight per cent. Cane	9.28	3.44	4.46	3.15	5.38	5.11	3.99	4.50	—	4.18	4.50	—	—	—	—	—	—	5.07	
SYRUP—																			
Brix	54.28	46.73	48.44	49.69	47.75	54.70	53.20	52.84	51.60	49.17	53.08	51.77	50.93	47.00	52.87	51.50	46.05	50.68	
Purity (apparent)	88.39	83.49	86.70	85.50	83.60	86.27	87.60	83.60	82.30	87.30	85.70	85.40	86.88	86.23	84.70	86.50	83.95	85.53	
Reducing Sugar Ratio	1.96	4.85	3.09	—	4.06	2.39	—	4.39	4.40	3.06	3.03	2.32	2.67	—	3.43	3.40	4.54	3.40	
pH	6.54	—	7.04	7.40	6.90	7.40	—	7.20	—	7.60	7.68	—	7.40	—	7.37	6.88	7.22	7.22	
Purity drop from First Crusher.. .. .	-1.69	-0.79	1.30	0.60	1.60	0.72	0.70	0.20	0.30	0.70	-0.10	1.80	0.57	0.38	1.10	0.10	0.91	0.50	
Purity increase from Mixed Juice	3.59	2.05	1.00	0.80	0.80	1.66	1.70	1.30	1.40	1.50	1.68	0.40	1.42	2.08	1.70	1.90	1.50	1.51	
Parts SO ₂ per million of Brix	—	—	—	590	492	—	—	—	—	—	—	—	—	—	—	—	—	541	
Per cent. Ash	—	—	—	—	—	—	—	3.36	—	2.97	—	—	—	—	—	—	—	3.16	
FIRST MASSECUITE—																			
Brix	91.66	93.76	92.14	91.65	94.56	92.20	90.80	94.37	94.24	92.49	92.90	90.85	93.19	91.32	92.18	91.60	93.12	92.53	
Purity (apparent)	89.13	75.93	86.70	83.50	76.60	83.96	86.70	79.10	81.80	80.00	78.40	83.60	83.20	85.01	84.20	84.70	82.77	82.66	
Purity of Run-off	73.28	—	65.60	66.10	48.80	54.28	66.40	55.60	—	57.30	56.20	68.50	60.18	65.52	64.50	65.30	61.85	61.96	
Cubic feet per ton of Sugar	—	50.26	—	—	—	—	—	51.71	—	49.24	—	51.95	—	—	50.96	—	—	50.82	
SECOND MASSECUITE—																			
Brix	94.31	93.66	96.31	93.13	96.27	93.27	93.20	96.11	94.95	95.18	94.00	93.21	96.81	93.34	94.79	95.20	94.74	94.62	
Purity (apparent)	79.77	62.95	71.40	69.20	65.20	72.95	71.50	63.10	68.00	67.90	67.60	71.20	67.23	72.40	64.40	70.80	67.05	69.19	
Purity of Run-off	58.36	—	46.90	50.80	41.20	52.49	51.00	41.80	—	44.60	45.50	53.00	42.49	52.78	45.20	46.90	46.88	47.99	
Cubic feet per ton of Sugar	—	70.92	—	—	—	—	—	38.68	—	40.62	—	50.25	—	—	59.70	—	—	52.03	
THIRD MASSECUITE—																			
Brix	96.45	—	97.25	—	—	—	93.80	—	94.85	—	—	92.81	97.26	94.15	—	—	95.40	95.25	
Purity (apparent)	66.26	—	60.10	—	—	—	64.30	—	60.30	—	—	61.60	55.64	60.95	—	—	56.71	60.73	
Purity of Run-off	46.69	—	39.70	—	—	—	41.00	—	—	—	—	50.20	36.90	42.85	—	—	—	42.89	
JELLY—																			
Brix	95.00	—	91.11	93.70	94.15	95.14	—	94.40	—	91.90	89.80	88.73	—	—	92.82	93.10	—	92.71	
Purity (apparent)	48.49	—	49.70	52.20	44.80	53.11	—	42.60	—	44.90	48.80	50.20	—	—	45.60	47.20	—	47.96	
FINAL MOLLASSES—																			
Brix	83.78	81.67	86.19	88.50	84.68	88.92	—	87.61	—	87.94	85.30	85.37	89.98	84.83	85.01	88.30	84.19	86.15	
Purity (apparent)	45.52	43.60	41.70	43.90	42.00	44.99	40.90	40.90	40.50	43.40	44.65	45.30	36.90	42.51	43.08	41.40	42.55	42.58	
85° Brix per cent. Cane	—	—	—	—	—	3.18	—	—	—	4.16	—	—	—	—	—	—	—	3.67	
POLARISATION OF SUGARS—																			
White	99.85	—	99.60	—	—	—	—	—	99.50	98.44	98.74	—	98.47	99.80	99.67	—	99.70	99.31	
Raw	96.70	—	98.42	—	—	—	—	—	98.30	98.39	98.28	—	98.71	97.70	97.09	—	97.65	97.92	
Average of all Sugars	99.24	97.51	99.11	97.94	97.72	96.00	99.45	99.04	99.36	98.41	98.60	98.60	98.53	98.53	98.70	97.96	98.83	98.45	
SO ₂ in parts per million	—	29.00	—	68.90	50.90	—	—	54.00	—	54.00	50.00	—	58.10	—	—	58.00	—	52.86	
FACTORY NUMBER	1	2	4	5	6	8	9	10	11	12	14	15	16	18	19	20	21	SEASON	

COMPARATIVE EXTRACTION AND RECOVERY FIGURES

COUNTRY	NATAL		JAVA		MAURITIUS	
	1933.	1934.	1932.	1933.	1932.	1933.
PRIMARY JUICE LOSS	51.88	49.67	37.46	36.68	37.14	37.14
REDUCED EXTRACTION	92.59	92.90	94.65	94.76	94.69	94.69
REDUCED BOILING-HOUSE RECOVERY	84.97	86.27	91.12	91.06	89.67	88.83
REDUCED OVERALL RECOVERY	78.67	80.14	86.24	86.29	84.91	84.11

COUNTRY	PUERTO RICO		QUEENSLAND		HAWAII		BRITISH GUIANA 1932.
	1932.	1933.	1931.	1932.	1930.	1931.	
PRIMARY JUICE LOSS	34.41	32.84	42.14	41.67	18.40	18.01	57.22
REDUCED EXTRACTION	95.08	95.31	93.98	94.05	97.37	97.43	91.83
REDUCED BOILING-HOUSE RECOVERY	—	—	—	—	92.23	92.33	90.11
REDUCED OVERALL RECOVERY	—	—	—	—	89.80	89.96	82.75

NOTE.—The above figures have been calculated on a common basis for Mixed Juice Purity and Fibre per cent. Cane (85.0 and 12.50 per cent.) respectively, in accordance with recommendation of the International Society of Sugar Cane Technologists.

COMPARATIVE RESULTS FOR RECENT YEARS.

COUNTRY	NATAL									
	1925.	1926.	1927.	1928.	1929.	1930.	1931.	1932.	1933.	1934.
CANE—										
Per cent. Sucrose	12.55	13.23	13.66	13.75	12.95	13.66	13.84	13.48	13.88	11.88
Per cent. Fibre	15.88	16.01	16.27	15.88	15.52	15.82	15.75	15.65	15.78	15.24
JUICES—										
Purity of First Crusher	87.24	87.11	88.30	87.80	88.81	88.66	87.92	87.89	87.46	86.03
Purity of Mixed Juice	84.47	84.65	85.47	84.90	86.04	85.88	85.27	85.30	84.92	84.02
Purity of last Roller Juice	78.20	76.12	80.20	78.50	80.72	80.79	79.99	79.20	78.26	76.71
Purity of Syrup	86.39	86.14	87.20	86.60	87.44	87.60	86.82	86.84	86.57	85.53
Drop in purity Crusher to Mixed Juice..	2.77	2.46	2.80	2.90	2.77	2.72	2.65	2.59	2.54	2.01
Drop in purity Crusher to last Mill ..	9.04	10.99	8.10	9.30	8.09	7.91	7.93	8.69	9.20	9.32
Drop in purity Crusher to Syrup	0.85	0.97	1.10	1.20	1.37	1.08	1.10	1.05	0.89	0.50
Increase in purity Mixed Juice to Syrup	1.92	1.49	1.70	1.90	1.40	1.73	1.55	1.54	1.65	1.51
Reducing Sugar Ratio to Mixed Juice ..	—	—	—	3.86	3.35	3.33	3.35	3.09	4.01	4.21
JAVA RATIO	75.77	75.73	77.78	76.78	77.01	76.36	76.92	76.99	77.27	78.66
BAGASSE—										
Per cent. Sucrose	4.03	3.53	4.06	4.10	4.07	4.20	4.22	3.83	3.71	3.05
Per cent. Moisture	49.38	49.33	49.89	50.01	50.69	50.66	50.09	51.89	51.62	52.11
EXTRACTION—										
Imbibition % Cane.. .. .	—	—	—	26.34	25.54	26.62	27.86	29.66	30.45	30.25
Sucrose in Juice % Sucrose in Cane ..	89.30	90.86	89.30	89.47	89.02	89.78	89.40	89.86	90.28	91.07
FILTER CAKE—										
Per cent. Sucrose	5.24	6.46	5.41	5.15	6.15	4.97	4.79	4.50	4.04	3.65
Weight % Cane	5.63	5.10	5.33	4.77	4.33	4.97	5.01	5.41	5.18	5.07
FINAL MOLASSES—										
Clerget purity	44.50	45.30	46.10	45.30	45.11	45.90	45.04	45.06	44.92	42.58
RECOVERY—										
Sucrose % Cane lost in manufacture ..	3.37	3.38	3.53	3.43	3.38	3.58	3.53	3.36	3.27	2.52
Sucrose in Sugar % Sucrose in Cane ..	73.28	74.48	74.13	75.06	75.13	74.77	74.39	75.73	76.63	77.59
Sucrose in Sugar % Sucrose in Juice ..	81.98	81.97	83.01	83.90	84.39	83.80	83.27	84.27	84.88	85.20
YIELD—										
Tons Cane per ton Sugar	10.77	9.92	9.69	9.49	10.06	9.59	9.53	9.61	9.28	10.67
Tons Cane per ton Sugar of 96° Pol. ..	10.46	9.74	9.48	9.30	9.87	9.40	9.33	9.40	9.03	10.40
LOSSES—										
Sucrose in Bagasse % Sucrose in Cane (A) ..	10.70	9.14	10.70	10.53	10.99	11.08	10.86	10.14	9.72	8.93
Sucrose in Filter Cake % Sucrose in Cane (B)..	2.44	2.49	2.11	—	—	—	—	—	—	—
Sucrose in Molasses % Sucrose in Cane (C) ..	—	—	—	—	—	—	—	—	—	—
Undetermined Sucrose % Sucrose in Cane (D)..	—	—	—	—	—	—	—	—	—	—
Sucrose lost in Boiling House % Sucrose in Cane (B)+(C)+(D)	16.06	16.38	15.17	14.41	13.88	14.15	14.56	14.13	13.85	13.43
Sucrose in Total Losses % Sucrose in Cane (A)+(B)+(C)+(D)	26.77	25.52	25.87	24.94	24.87	25.23	25.42	24.27	23.57	22.36
SUGAR—										
Average Polarization of all Sugars ..	98.89	97.74	98.08	98.00	97.87	97.96	98.08	98.14	98.68	98.45

COUNTRY	JAVA ¹		MAURITIUS ²		PUERTO RICO ³		QUEENSLAND ⁴		HAWAII ⁵		British Guiana ⁶ 1932.
	YEAR	1932.	1933.	1932.	1933.	1932.	1933.	1932.	1933.	1930.		1931.
CANE—											
Per cent. Sucrose	13.22	13.72	13.06	13.19	12.62	13.11	15.94	15.90	12.49	12.63	11.05
Per cent. Fibre	12.60	12.60	12.90	12.90	13.65	13.85	12.28	11.51	12.63	12.53	12.48
JUICES—											
Purity of First Crusher	—	—	86.80	87.30	—	—	89.59	89.64	87.04	86.47	81.44
Purity of Mixed Juice	83.40	85.40	84.30	84.40	—	—	—	—	84.25	83.71	79.43
Purity of last Roller Juice	—	—	75.40	75.60	—	—	—	—	68.62	68.24	—
Purity of Syrup	—	—	84.40	85.00	84.15	85.18	89.28	89.42	85.53	84.91	—
Drop in purity Crusher to Mixed Juice..	—	—	2.50	2.90	—	—	—	—	2.79	2.76	2.01
Drop in purity Crusher to last Mill ..	—	—	11.40	11.70	—	—	—	—	18.42	18.23	—
Drop in purity Crusher to Syrup	—	—	2.40	2.30	—	—	0.31	0.22	1.51	1.56	—
Increase in purity Mixed Juice to Syrup	—	—	0.10	0.60	—	—	—	—	1.28	1.20	—
JAVA RATIO	—	—	—	—	—	—	—	—	—	—	—
BAGASSE—											
Per cent. Sucrose	2.84	2.94	2.84	2.83	2.36	2.48	3.31	3.26	1.49	1.48	3.44
Per cent. Moisture	44.90	44.80	44.70	44.70	48.18	46.47	52.56	52.16	41.25	40.83	47.13
EXTRACTION—											
Imbibition % Cane	—	—	—	—	28.56	27.01	—	—	33.26	33.19	—
Sucrose in Juice % Sucrose in Cane ..	94.60	94.70	94.50	94.50	94.56	94.72	94.10	94.58	97.34	97.42	91.84
FILTER CAKE—											
Per cent. Sucrose	3.30	3.30	7.90	7.70	—	—	—	—	1.87	1.72	—
Weight % Cane	—	—	1.90	1.80	—	—	—	—	2.81	2.83	—
FINAL MOLASSES—											
Clerget purity	30.50	30.60	39.50	40.00	30.78	30.20	48.49	48.37	36.69	36.32	32.68
RECOVERY—											
Sucrose % Cane lost in manufacture ..	1.87	1.84	2.20	2.17	1.68	1.55	—	—	—	—	—
Sucrose in Sugar % Sucrose in Cane ..	85.83	86.57	84.30	83.60	86.80	88.10	86.37	86.88	89.33	89.17	78.56
Sucrose in Sugar % Sucrose in Juice ..	90.63	91.34	89.10	88.30	91.87	93.00	91.79	91.86	91.77	91.54	85.49
YIELD—											
Tons Cane per ton Sugar	8.96	8.44	—	—	8.59	8.41	6.94	6.88	8.78	8.71	11.11
Tons Cane per ton Sugar of 96° Pol. ..	—	—	—	—	8.52	8.15	6.78	6.72	8.63	8.56	11.12
LOSSES—											
Sucrose in Bagasse % Sucrose in Cane (A) ..	5.34	5.28	—	—	0.65	0.69	—	—	2.66	2.58	8.21
Sucrose in Filter Cake % Sucrose in Cane (B) ..	0.62	0.69	—	—	0.11	0.08	—	—	0.42	0.39	0.70
Sucrose in Molasses % Sucrose in Cane (C) ..	6.53	5.79	—	—	0.84	0.75	—	—	7.45	7.70	—
Undetermined Sucrose % Sucrose in Cane (D) ..	1.68	1.67	—	—	0.08	0.05	—	—	0.14	0.17	12.53
Sucrose lost in Boiling House % Sucrose in Cane (B)+(C)+(D)	8.83	8.15	—	—	1.03	0.88	—	—	8.01	8.26	13.23
Sucrose in Total Losses % Sucrose in Cane (A)+(B)+(C)+(D)	14.17	13.43	—	—	1.68	1.57	—	—	10.67	10.84	21.44
SUGAR—											
Average Polarization of all Sugars	—	—	98.60	98.60	96.77	96.91	98.18	98.35	97.66	97.69	96.13

¹ From the "International Sugar Journal."

² "La Revue Agricole."

³ By courtesy of the Sugar Producers' Association of Puerto Rico.

⁴ From the Annual Reports of the Bureau of Sugar Experiment Stations, Queensland.

⁵ From the Hawaiian Sugar Planters' Association Experiment Station.

⁶ From the Agricultural Journal of British Guiana.

Average Manufacturing Results by periods for Natal Sugar Factories Reporting to the Experiment Station, Season 1934-35.

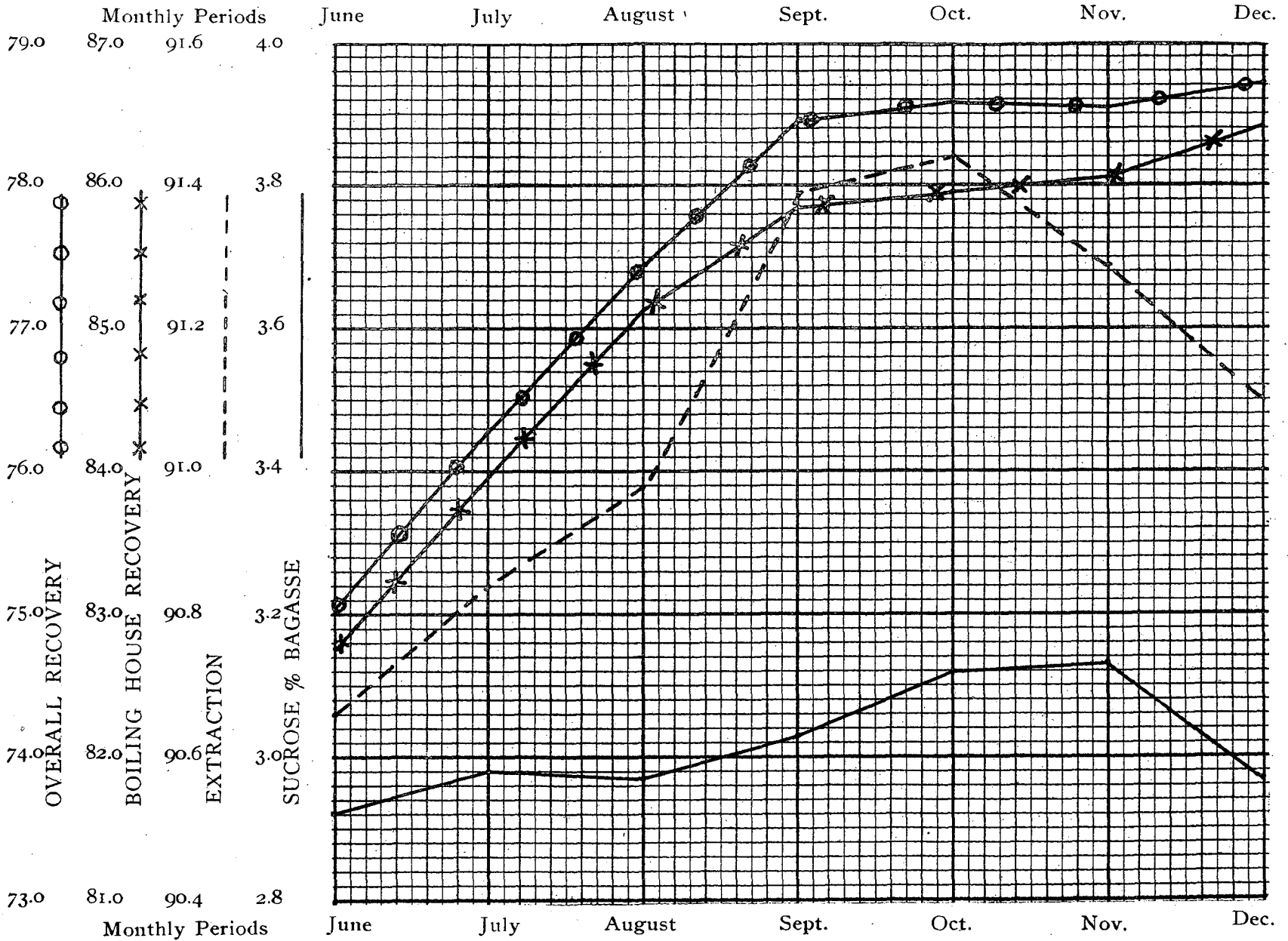
Period ending	..	..	..	JUNE	JULY	SEPT.	SEPT.	NOV.	DEC.	DEC.	SEASON.
				30th, 1934.	28th, 1934.	1st, 1934.	29th, 1934.	2nd, 1934.	1st, 1934.	29th, 1934.		
Tons of 2,000 lbs. Cane crushed	This period	338,581	450,486	641,092	558,875	687,065	534,025	319,613	3,696,098 short tons. <i>3353,078 metric tons.</i>
				To date	338,581	789,067	1,430,159	1,989,034	2,676,099	3,210,124	3,529,737	
Tons of 2,000 lbs. Sugar bagged and estimated..	This period	28,447	39,200	57,546	53,967	68,689	52,987	30,504	346,242 short tons. <i>314,109 metric tons.</i>
				To date	28,447	67,647	125,193	179,160	247,849	300,836	331,340	
Tons Cane per ton Sugar	This period	11.90	11.49	11.10	10.36	10.00	10.08	10.48	10.67
				To date	11.90	11.67	11.42	11.10	10.80	10.67	10.65	
Tons Cane per ton of Sugar calculated as sugar of } 96° Pol	This period	11.58	11.20	10.82	10.10	9.78	9.85	10.25	10.40
				To date	11.58	11.66	11.13	10.82	10.53	10.41	10.39	
Sucrose per cent. Cane	This period	11.14	11.24	11.46	12.12	12.49	12.42	11.90	11.88
				To date	11.14	11.17	11.30	11.53	11.78	11.88	11.88	
Fibre per cent. Cane	This period	15.86	15.25	15.25	15.06	14.98	15.06	15.29	15.24
				To date	15.86	15.51	15.39	15.30	15.21	15.19	15.20	
Sucrose per cent. Bagasse	This period	2.92	2.98	2.97	3.03	3.12	3.13	2.97	3.05
				To date	2.92	2.98	2.99	2.98	3.01	3.03	3.03	
Imbibition per cent. Cane	This period	32.36	31.29	31.24	30.00	29.81	29.86	29.35	30.25
				To date	32.36	31.96	31.64	31.18	30.83	30.67	30.55	
Extraction	This period	90.66	90.84	90.98	91.39	91.44	91.29	91.10	91.07
				To date	90.66	90.75	90.85	91.01	91.13	91.16	91.15	
Recovery on Mixed Juice	This period	82.76	83.97	85.13	85.85	85.95	86.04	86.41	85.20
				To date	82.76	83.33	84.02	84.56	84.98	85.16	85.27	
Overall Recovery	This period	75.03	76.28	77.45	78.45	78.59	78.55	78.71	77.59
				To date	75.03	75.62	76.34	76.96	77.44	77.63	77.73	
Java Ratio	This period	79.42	79.84	78.84	78.67	78.58	78.18	77.20	78.66
				To date	79.42	79.72	79.34	79.13	78.98	78.83	78.68	
SO ₂ in Sugar p.p.m...	This period	57.60	53.57	48.39	48.72	53.41	51.41	53.61	52.86
				To date	57.60	55.30	49.65	49.80	48.55	51.82	52.79	
Purity of Mixed Juice	This period	83.23	83.18	83.65	84.41	84.51	84.72	84.43	84.02
				To date	83.23	83.23	82.99	83.70	83.93	84.07	84.10	
Reducing Sugar Ratio	This period	4.45	5.64	4.14	4.14	4.04	3.94	4.10	4.21
				To date	4.45	5.52	4.32	4.26	4.20	4.15	4.15	
Purity of Syrup	This period	85.26	84.31	85.07	85.67	85.75	85.97	85.34	85.53
				To date	85.26	84.31	84.61	84.93	85.14	85.29	85.31	
Sucrose in Filter Cake	This period	2.32	2.62	2.96	3.36	3.60	3.69	3.54	3.65
				To date	2.32	2.51	2.72	2.90	3.08	3.18	3.22	
Purity of Final Molasses	This period	44.94	42.97	42.78	43.19	42.58	42.83	44.24	42.58
				To date	44.94	43.19	42.83	42.94	42.80	42.83	42.87	
Average Polarization of Sugar	This period	98.62	98.52	98.52	98.47	98.17	98.29	98.15	98.45
				To date	98.62	98.56	98.54	98.52	98.46	98.43	98.40	

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

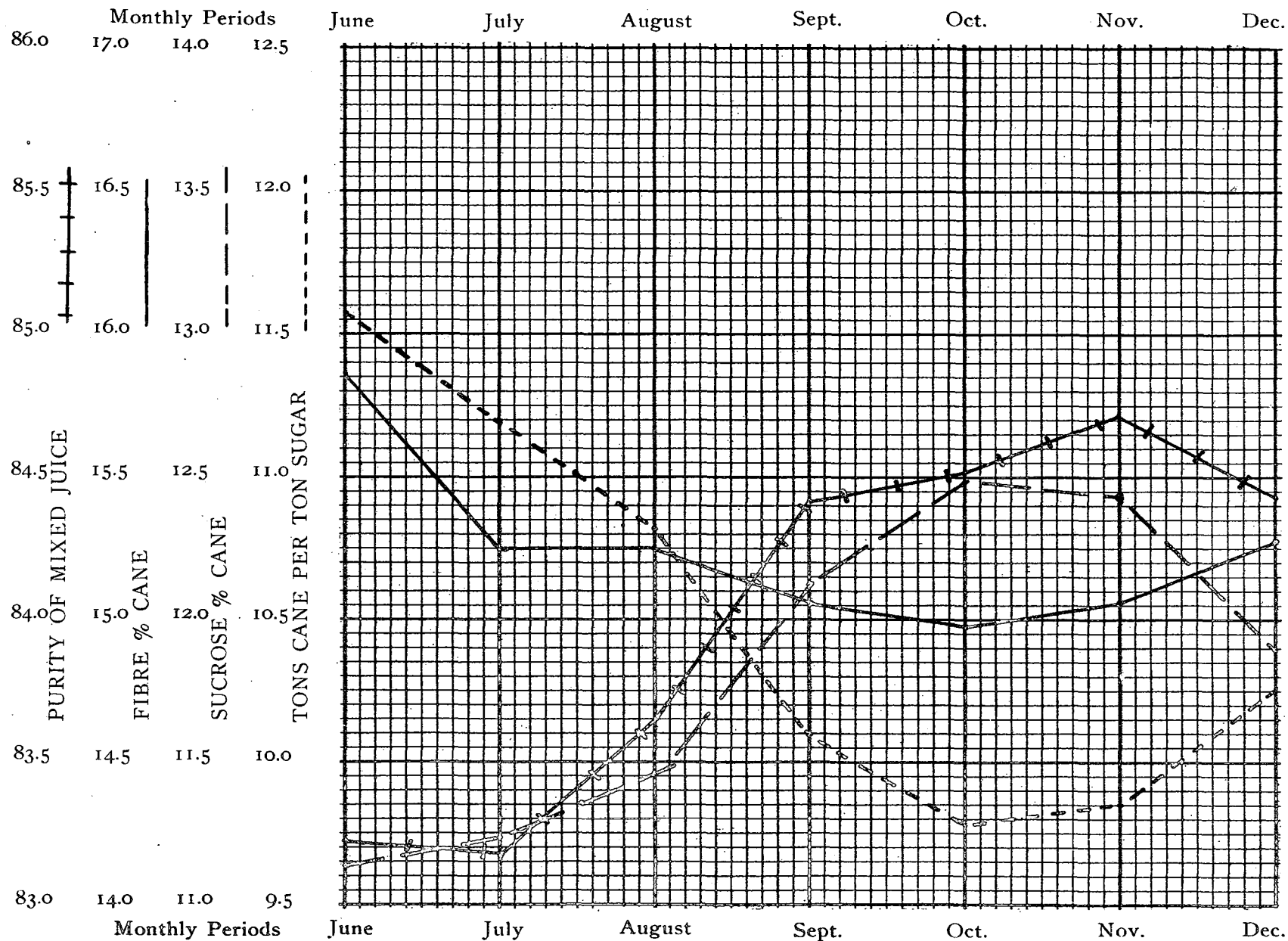
COMPILED FROM UNION DEPARTMENT OF CENSUS RETURNS.

DISTRICT.	PER CENT. OF TOTAL TONNAGE.								TONS CANE PER ACRE.							
	1926.	1927.	1928.	1929.	1930.	1931.	1932.	1933.	1926.	1927.	1928.	1929.	1930.	1931.	1932.	1933.
PORT SHEPSTONE	1.7	1.6	1.8	1.9	2.1	2.3	2.6	2.0	17.68	16.72	19.98	17.40	18.60	18.80	19.57	20.47
UMZINTO	14.1	14.8	17.8	17.8	13.9	18.5	20.2	18.3	17.74	17.57	19.33	20.10	22.30	20.80	22.24	21.68
DURBAN AND PINETOWN	4.6	4.7	4.7	4.8	5.1	5.2	5.0	4.2	21.39	19.49	22.64	24.80	26.77	22.90	21.75	23.00
Total South of Umgeni River	20.4	21.1	24.3	24.6	21.1	26.0	27.9	24.5	18.44	17.89	19.77	20.60	22.76	21.00	21.87	21.79
Ratio to 1926 (= 100)	—	—	—	—	—	—	—	—	100.0	97.00	107.20	111.70	123.40	114.10	118.60	118.17
INANDA	15.1	15.8	13.3	14.8	12.8	14.3	14.4	15.4	16.72	16.79	18.45	20.50	22.01	19.20	20.14	22.80
LOWER TUGELA	22.8	21.7	24.8	24.5	26.9	24.6	23.9	25.3	20.10	19.02	20.08	20.80	22.12	18.20	18.36	19.45
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	18.61	18.01	19.48	20.68	22.08	18.60	18.99	20.59
Ratio to 1926 (= 100)	—	—	—	—	—	—	—	—	100.00	96.80	104.70	111.10	118.10	100.00	102.00	110.64
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	18.55	17.97	19.59	20.65	22.31	19.40	20.11	21.03
Ratio to 1926 (= 100)	—	—	—	—	—	—	—	—	100.00	96.90	105.60	111.30	120.30	104.60	108.40	113.37
MTUNZINI	15.1	15.1	13.4	12.5	13.4	12.6	11.4	10.8	22.39	21.16	20.84	20.70	22.53	18.10	17.55	18.40
ESHOWE	2.4	2.7	3.5	2.7	4.5	4.2	3.4	3.7	22.55	20.88	22.76	20.60	20.22	18.90	16.69	17.47
LOWER UMFOLOZI	24.0	21.2	18.3	18.6	17.9	16.2	16.7	17.8	25.00	22.57	22.99	21.60	23.83	18.00	18.63	19.84
HLABISA	—	2.4	2.5	2.4	3.4	2.3	2.4	2.5	—	16.93	18.58	17.80	19.55	14.60	16.17	17.31
Total North of the Tugela (Zululand)	41.6	41.4	37.6	36.1	39.2	35.2	33.8	34.8	23.83	21.50	21.83	20.92	22.50	17.90	17.86	18.91
Ratio to 1926 (= 100)	—	—	—	—	—	—	—	—	100.00	90.20	91.60	87.80	94.40	75.20	74.95	79.35
GRAND TOTAL FOR NATAL (including Zululand)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	20.44	19.28	20.38	20.75	22.39	18.90	19.29	20.24
Ratio to 1926 (= 100)	—	—	—	—	—	—	—	—	100.00	94.30	99.70	101.50	109.50	92.60	94.40	99.02

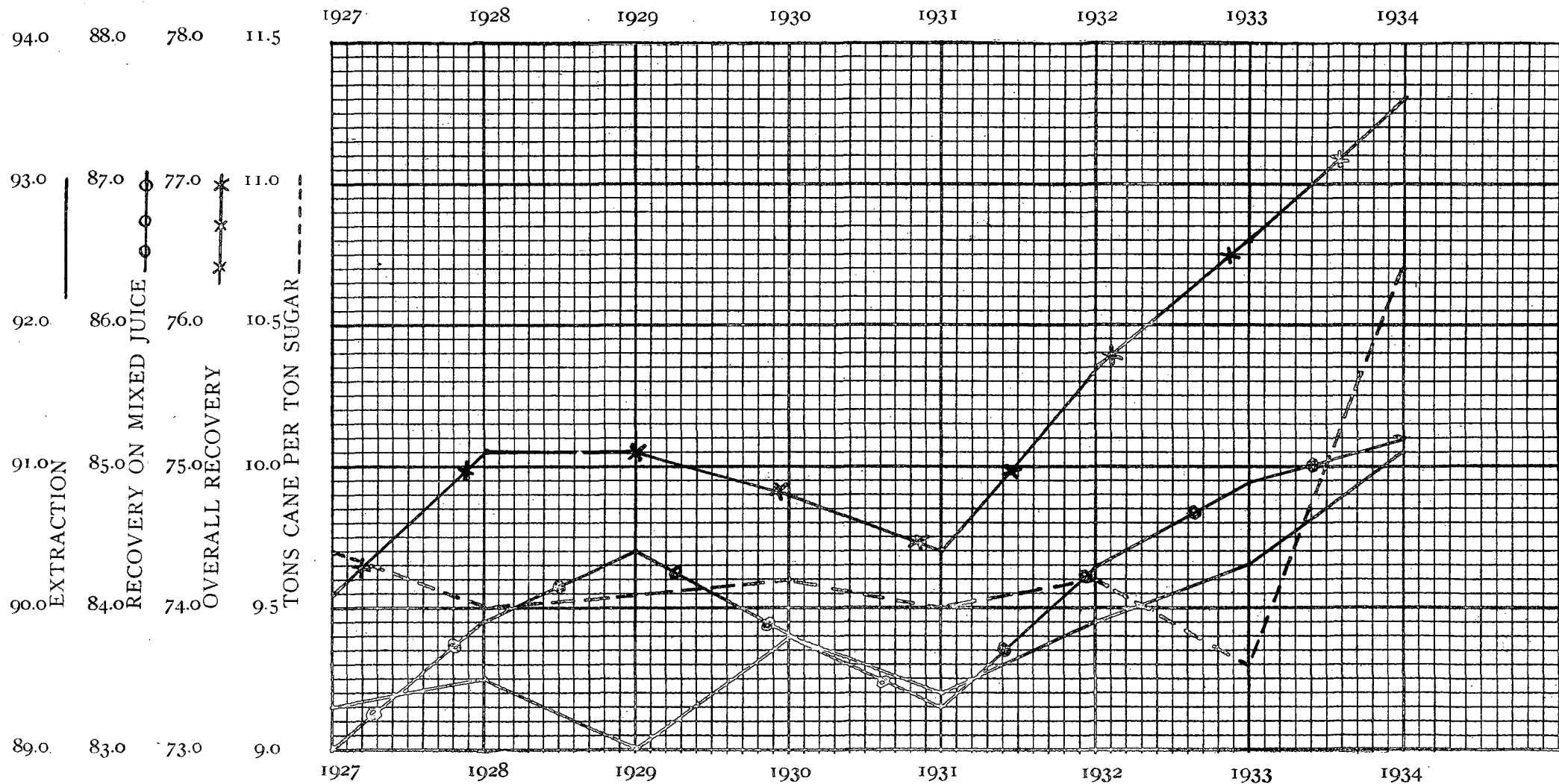
MONTHLY AVERAGES FOR NATAL SUGAR FACTORIES SEASON 1934-35.



MONTHLY AVERAGES FOR NATAL SUGAR FACTORIES SEASON 1934-35.

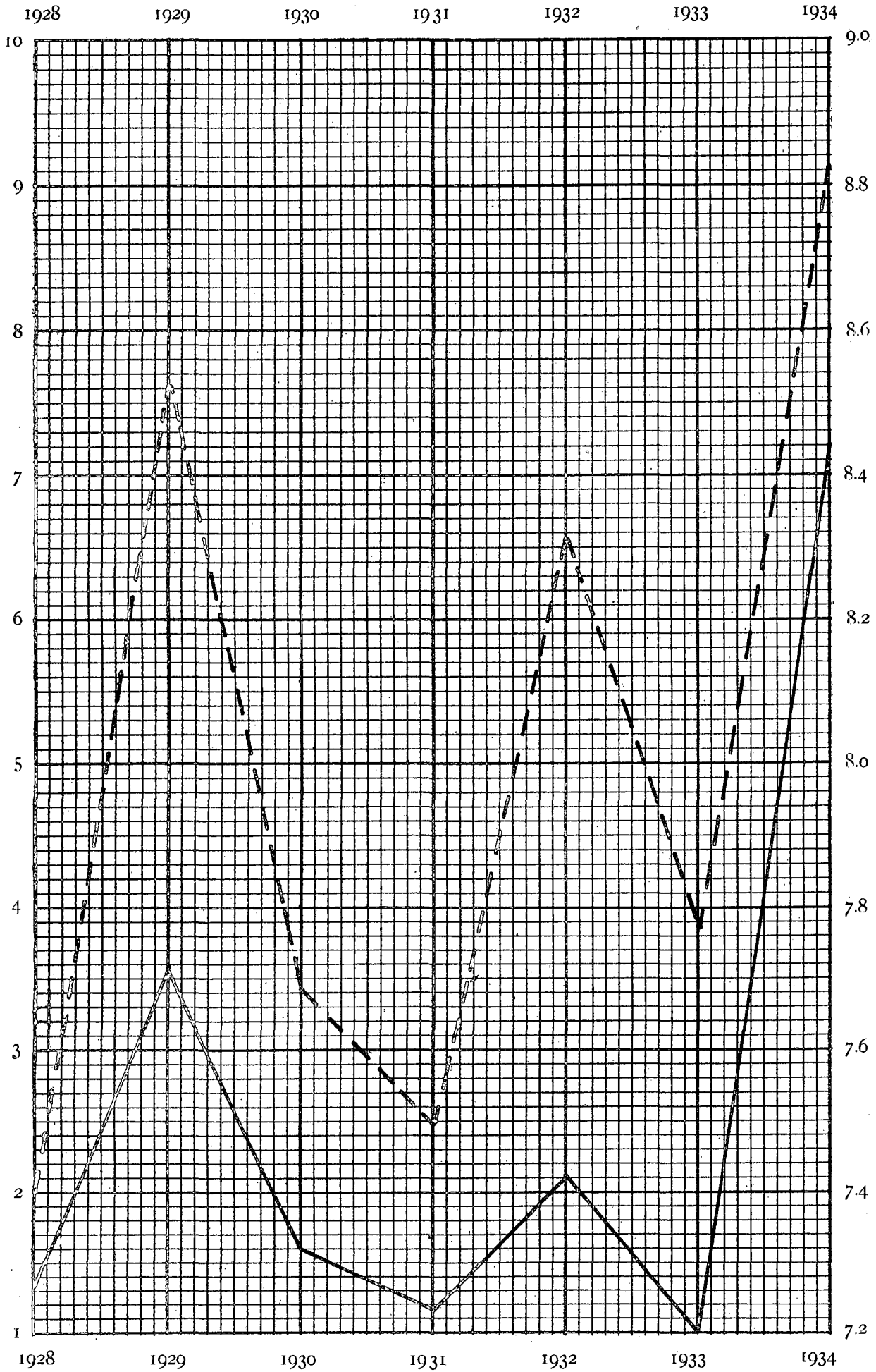


EXTRACTION AND RECOVERY FIGURES 1927 to 1934



RELATION OF RAINFALL FOR THE APRIL/JUNE PERIOD TO THE AVERAGE SUCROSE CONTENT OF CANE FOR THE SEASON.

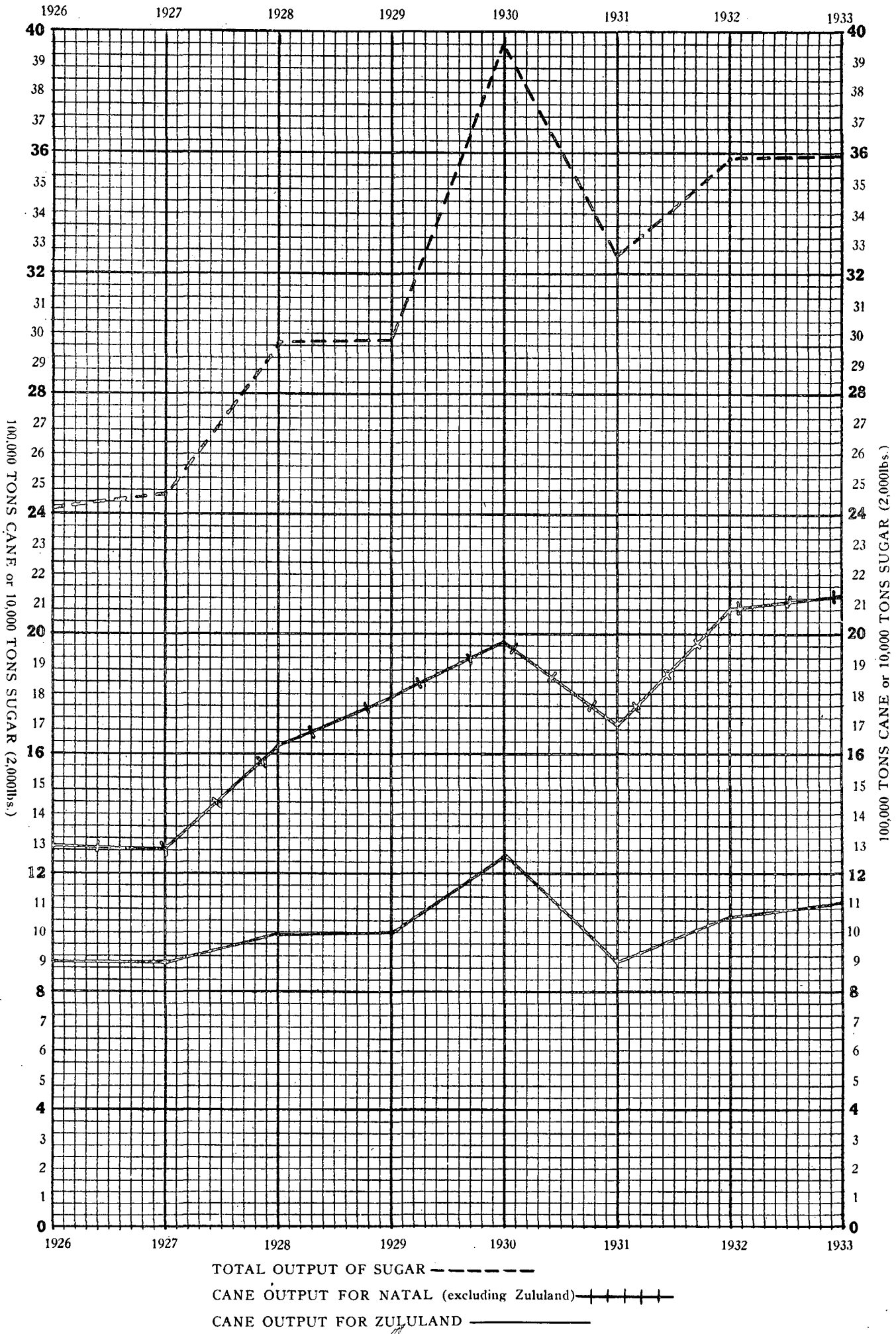
Ratio of Cane to Sucrose.—Actual not recovered (reciprocal of Sucrose Content).
 Total Rainfall during months April to June (inclusive).



TONS CANE PER ACRE.

TOTAL OUTPUT OF SUGAR FROM NATAL, 1926-1933.

ALSO CANE OUTPUT FROM ZULULAND AND FROM REST OF NATAL RESPECTIVELY
(EUROPEAN PLANTERS ONLY)



TOTAL OUTPUT OF SUGAR -----
 CANE OUTPUT FOR NATAL (excluding Zululand) + + + + +
 CANE OUTPUT FOR ZULULAND _____

**YIELD OF CANE IN TONS PER ACRE OVER RECENT YEARS
(EUROPEAN PLANTERS)**

