

FORTY-EIGHTH ANNUAL REVIEW OF THE MILLING SEASON IN SOUTHERN AFRICA (1972-73)

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Except when otherwise stated all data listed in the tables are as reported by the factories

Introduction

This review follows the same pattern as those of previous seasons. Some items have been excluded and others added in the tables and these changes are commented upon in the appropriate sections.

A list of symbols used to designate each mill is given in Table 1.

For the first time, results for all sugar factories in Mozambique are listed and totals and averages for Portuguese East Africa have been calculated. This has made it necessary to split tables B to F into two parts: Part 1 lists data for South African mills, and Part 2 data for Mozambique, Swaziland and Malawi.

The impossibility of finding an acceptable formula to proportion the time lost in factories with two sets of mills has led to publishing separate time accounts and performance data for each tandem. Greater uniformity has been achieved in reporting boiling house performance data for factories with back-end refineries. All figures reported this season are on the basis of sugar as produced by the mills without any correction for the refinery. The only exception is for high test molasses produced at ME which has been converted to equivalent raw sugar.

The 1972/73 Season

The season started on the 13th April, 1972 at Illovo and ended on the 28th February, 1973 with the last cane crushed at Amatikulu. Overall length of the season was 322 days but the average number of available days for South African mills was 268.

Heavy rains early in the season slowed down production, particularly in the Transvaal, Swaziland and Northern Zululand and low rainfall at the end of the year must have adversely affected cane production. In spite of this 16 804 645 tons of cane were crushed in South Africa, which is only 108 805 tons less than the 1967/68 record. Sugar production set a new record at 1 914 601 tons and exceeded the highest previous production (1971/72) by 49 936 tons. This tonnage includes the sugar equivalent of high test molasses produced at Mount Edgecombe.

Factory performance was good but lower than the record established last year in spite of better quality cane, especially with respect to juice purity. This is disappointing and cannot be explained by an increase in throughput as tonnage of cane ground per hour was only slightly higher than during the 1971/72 season. However, the performance of some mills was outstanding and the overall recovery of DL (88,30) is believed to be the highest ever recorded by a mill in South Africa.

TABLE I
Mills and their Symbols

South Africa		Company
Symbol	Mill	
ML	Malelane	Transvaalse Suikerkorporasie Beperk
PG	Pongola	Pongola Sugar Milling Co. Ltd.
UF	Umfoloz	Umfoloz Co-operative Sugar Planters Ltd.
EM	Empangeni	Hulets Corporation Ltd.
FX	Felixton	Hulets Corporation Ltd.
EN	Entumeni	Entumeni Sugar Milling Co. (Pty) Ltd.
AK	Amatikulu	Hulets Corporation Ltd.
DK	Doornkop	Doornkop Sugar Co (Pty) Ltd.
GD	Glendale	Glendale Sugar Millers (Pty) Ltd.
DL	Darnall	Hulets Corporation Ltd.
GH	Gledhow	Gledhow Sugar Co. Ltd.
MV	Melville	Melville Sugar Estates
JB	Jaagbaan	Noodsberg Sugar Co. Ltd.
UC	Dalton	The Union Co-operative Bark & Sugar Co. Ltd.
TS	Tongaat	Tongaat Sugar (Pty.) Limited.
ME	Mount Edgecombe	Hulets Corporation Ltd.
IL	Illovo	Illovo Sugar Estates Ltd.
RN	Renishaw	Crookes Brothers Ltd.
SZ	Sezela	Reynolds Brothers Ltd.
UK	Umzimkulu	The Umzimkulu Sugar Co. Ltd.
Mozambique		
LB	Luabo	Sena Sugar Estates Ltd.
MR	Marromeu	Sena Sugar Estates Ltd.
AM	Açucareira de Moçambique	Açucareira de Moçambique S.A.R.L.
BZ	Buzi	Companhia do Buzi S.A.R.L.
IC	Incomati	Sociedade Agricola do Incomati S.A.R.L.
MA	Maragra	Marracuene Agricola Açucareira S.A.R.L.
Swaziland		
MH	Mhlume	Mhlume (Swaziland) Sugar Co. Ltd.
UR	Ubombo Ranches	Ubombo Ranches Ltd.
Malawi		
NH	Nchalo	The Sugar Corporation of Malawi Ltd.

Types of sugar produced in South Africa and their destination are given in Table A. Except for PG and ML white sugar production by back-end refineries has been lower than during the previous season. Brown sugar production is also lower by about 3 000 tons while raw sugar refined by Hulsar for the local market has increased by about 29 000 tons. Export of refined was 26% higher than in 1971/72.

Tons of crystal in sugar calculated on the basis of 39,8 purity molasses is tabulated in Table B.

In Mozambique, 2 936 136 tons of cane were crushed during a season which averaged 200 available days and 326 152 tons of sugar were produced. In some of the mills, notably MA, expansion work carried out during the off season led to a late start and affected factory performance.

Swaziland sugar production dropped by about 5 000 tons from the previous season because of a poorer cane crop at UR while Malawi's sugar production was almost the same as in 1971/72 in spite of a larger cane crop.

Time account

A method of proportioning lost time in factories with two milling tandems which would satisfy everybody has not been found. It has therefore been decided to report separate time accounts for each tandem in order to put all mills on a comparable basis.

In South Africa, the highest time efficiency is reported by UC (82,30) mainly because of very little time lost for lack of cane (0,60) and because this mill, having stopped on the 23rd December, was not affected by Christmas holidays.

Industrial average down time for no cane was 5,30% which is an improvement over last season (6,39%). The two mills which have been the most affected by irregular cane supply are ML (10,88%) and GD (9,06%).

Weekend stops have been renamed scheduled stops which is a more appropriate name since a number of mills close down for maintenance on weekdays. Analysis of the figures listed in Table B shows that there is still cause for confusion when comparing the scheduled stops of different mills. It is evident that some mills credit any excess time over that scheduled for the weekly stop to "other stops" while others do not programme a definite time for their weekly stop and therefore report higher scheduled stops. Extreme cases are UF and ME with 2,69 and 2,90 for scheduled stops of the two tandems at UF and 16,33 for ME. On the other hand "other stops" are only 1,75 at ME as against 13,72 and 14,00 at UF.

The best time efficiency of all mills is reported by LB in Mozambique (85,30) in spite of a higher than average time lost for lack of cane. Scheduled stops at LB were 3,69% and stops for other reasons only 2,48%. The sum of these two stops at LB was only 35% of the average for South African mills and 28% of the Mozambique average.

Cane varieties and cane quality

A complete variety breakdown of all cane crushed in South Africa, and in some of the mills in neighbouring countries is given in Table G. Comparison with last season's industrial average for South African mills reveals no appreciable difference in any variety except for a slight increase in the proportion of N55/805 which now accounts for 5,9% of all cane crushed. The percentage of mixed varieties is still very high (17,8%) specially at EM, AK and MV.

For South African mills, this was one of the best seasons since 1965 as far as cane quality is concerned. Pol was comparatively high (13,26) and fibre (14,82) one of the lowest on record. Mixed juice purity (86,66) was the highest ever reported since 1925 (Table J). MR in Mozambique reports the highest sucrose in cane (14,56) but the average quality of cane in Mozambique was not much better than in South

Africa, the higher sucrose content being accompanied by lower juice purities.

Cane transport

Table H gives the transport breakdown for all South African mills. These figures have been obtained from the Central Board and the industrial average does not include the two co-operative mills: UF and UC. Figures listed for these two mills do not give a break down of road transport.

The percentage of cane transported by different types of vehicles is unchanged from last season except for a slight increase in cane delivered by South African Railways and a corresponding decrease in cane transported by lorry. Extreme examples of reliance on one type of transport are provided by PG which gets all its cane by tram and EN which is supplied only by lorry.

Cane preparation and juice extraction

The steady improvement in mill performance which has been recorded for the past seven years has suffered a setback in 1972/73. Extraction was lower than during the past season although fibre % cane was the same. Both pol and moisture in bagasse were higher than in 1972/73.

Up to this season mills had been able to increase their capacity without fall in performance and, in many cases, with an increase in extraction. We may now have reached the point where this is no longer possible without additional equipment. Of the twenty South African mills, twelve report increased throughput over last season and in nine of these mills pol in bagasse also increased. Only two mills (EM and UF) have increased their tonnage while reducing pol losses in bagasse.

Average cane and fibre throughput of South African mills were 169,51 and 25,12 as compared to 164,34 and 24,36 respectively for the previous season. The highest crushing rate is reported by AK with 306 tons of cane per hour and nine mills have crushed at or above 200 tch.

Increases in grinding capacity are also reported by the two Swaziland mills and by NH. In Mozambique, LB has increased its throughput by 12 TCH without modification to the milling plant while MA and AM have both undergone extensive modifications to increase milling capacity.

Lost Absolute Juice % Fibre, the principal factor used to evaluate mill performance during the past years, has been affected by changes in analytical methods, in particular Brix in bagasse, applied this season. Values of Lost Absolute Juice % Fibre are therefore not comparable with those of previous seasons and comparisons should be restricted to Extraction and pol % bagasse.

It is generally agreed that no single formula available at present takes into account all variables affecting milling performance. It is therefore advisable to use several formulae to compare mill work and values of milling loss (sucrose % fibre in bagasse) are also listed in Table B.

Performance data for the five factories which have reported the best mill work during the past season are listed in Table II. Best results are still reported by diffusion mills but UC has now dropped the lead which it had maintained during several seasons and EN has moved into first place. EM shows that a diffuser can achieve very good results in spite of increases in capacity. This mill reports 96,24 extraction at 203 tch. The performance of the three other diffusers (ML, NH and UF-A tandem) is comparatively disappointing.

A standardisation of analytical methods used to determine pol in final bagasse throughout the South African industry may be responsible for the poorer results reported by some of the mills this season. In some cases the new cold disintegrators used for bagasse analysis have produced higher pol than the disintegrators formerly used.

Cane preparation is still receiving a lot of attention and modifications to shredders have been carried out in several mills. TS have installed a new shredder with heavy hammers on their larger tandem. Another approach has been taken at MA where a shredder has been replaced by a third set of knives.

The term Preparation Index has been chosen to indicate the results of broken cells determination in prepared cane. It is still the best way of evaluating cane preparation and should be a routine determination in all mills. Research carried out during the past year has shown that the reproducibility of results is not very good and a large number of determinations and strict adherence to procedure are required if reliable averages are to be obtained. Sampling still remains the greatest source of error and a method using sampling equipment installed by the Central Board for cane payment purposes is being developed.

New equipment commissioned during the past season includes new self setting mills at MA and AM and a completely automated cane and mill carriers drive at this latter mill. A new last mill has been installed at UR and the diffuser at NH has been lengthened and dewatering rolls added. At AK a hydraulically driven two-roll feeder has been fitted to the first mill which has become a 6 roller unit. TS has attempted to control the ever increasing cost of maintenance of mills by using an all steel mill roller.

Several minor changes to the Saturne diffuser at UF have improved the performance of this unit and the first mill at EM was bypassed to allow the diffuser to operate as a cane diffuser. There was a fall in

TABLE II
Milling Performance Data

Factory	Pol % Bagasse	Extraction	L.A.J. % F	Sucrose % Fibre in Bagasse
EN*	1,33	97,02	26	2,96
EM*	1,34	96,24	28	3,00
UC*	1,40	96,92	32	2,99
ME	1,47	96,27	31	3,28
JB	1,50	96,31	30	3,34

* Diffusion

extraction but no apparent effect on boiling house work.

Clarification, filtration and evaporation

The main development in clarification has been the conversion of a Rabe clarifier into a pilot trayless clarifier at GH. Results obtained with this 46 ton unit have been very encouraging and have shown that clarified juice obtained after 30 minutes retention in this clarifier was superior to juice from a conventional Dorr.

TABLE III
Clarifier Comparison at Gledhow

	Mixed Juice	Clear Juice	
		Trayless	Rapidorr
Purity	88,0	88,67	88,28
pH		7,69	7,36
pH (mud)		7,57	7,19
Colour (a*c) 560		2,27	2,27
Turbidity		1,41	2,50
P ₂ O ₅ (ppm/Brix)	1 910	327	422
Red. sugars (% Brix)	3,18	2,65	2,81
Calcium (CaO ppm/Brix)		1 660	1 750
Magnesium (MgO ppm/Brix)		1 240	1 280
Temperature °C		98	97

Modification of juice draw-off piping has been carried out in a number of Rapidorr clarifiers and has always resulted in increases in capacity. At JB these modifications are reported to have doubled the capacity of the Rapidorr and have enabled one 9,75 m diameter unit to process juice from a weekly average crush of 220 tch. This is equivalent to a retention time of less than two hours.

Probably as a result of higher throughputs, most mills have made greater use of flocculants than last year and only one mill reports no addition of flocculant. The use of liquid phosphoric acid instead of calcium phosphate has enabled UC and JB to cut down their phosphoric acid addition by half.

pH of clarified juice averaged 7,2 but varied from 7,5 to 6,9 while that of syrup ranged from 7,2 to 6,1 (6,5 average). As can be expected, lime added per 1 000 tons of cane also varies (for factories without refineries) but this variation is not proportional to changes in pH. Thus EM reports 0,90 tons lime per 1 000 tc. and a pH of clarified juice of 7,3 and 6,4 in syrup while TS with 0,38 tons lime per 1 000 tc. has a pH of 7,3 in clarified juice and 7,1 in syrup. pH control is unsatisfactory in many mills and average values can be dangerous as they sometimes cover very wide fluctuations of relatively short duration. Where difficulties are due to clogging of milk of lime piping, the use of saccharate of lime could be an advantage. Change in reducing sugar to sucrose ratio from clarified juice to syrup is also very variable (from + 0,7 to -0,9) and would be worth closer examination in some factories.

The average Brix of syrup (63,22) is again higher than during the previous season for South African mills. However the Brix reported by LB (69,50)

shows that it is possible in practice to work at higher syrup densities and improve steam economy. A new Kestner pre-evaporator has been commissioned at AK this season and a semi-Kestner at UR and MA. Roberts vessels have been added to the evaporators at FX and AM.

Average pol in filter cake is the same as in 1971/72 with some mills showing better filter work while others report higher losses than last year. SZ and UK are now the South African mills with the lowest pol in cake (0,71 and 0,69) while UR once again reports the best work with 0,36 pol.

Boiling house

This is the first season during which all mills in South Africa have used refractometers for Brix determination and results of individual mills are therefore comparable. Three mills in Mozambique still use hydrometers for Brix determination and their molasses Brix and purity are preceded by the letter S.

Two changes in chemical control methods which have been applied during the season have affected boiling house performance figures. A correction for suspended solids in mixed juice has been applied in all South African mills as from the last week in August. Percentage of suspended solids in mixed juice is listed in Table C1. Industrial average was 0,59 with the highest value 1,37 reported by JB. This correction has affected boiling house recovery and undetermined loss and makes this season's values not strictly comparable with those of previous years. The other change has been to replace sucrose in mixed juice by pol.

One of the control parameters which have been the most affected by these changes is Non Sucrose Ratio. The spread in values reported by different mills has decreased and there is no longer any relation between good boiling house performance and value of non sucrose ratio. This is shown in Table IV

TABLE IV
Boiling House Results
(South African Mills)

Factory	B.H. Recovery	B.H. Losses	Non-Sucrose Ratio
DK	92,11	7,39	0,92
DL	91,95	7,73	0,92
TS	91,29	8,28	0,88
MV	91,07	8,55	0,80
AK	90,50	9,06	0,86
UK	90,44	9,22	0,94
GD	90,39	9,02	0,94
SZ	90,18	9,39	0,87
ME	89,77	9,84	0,87
UF	89,44	10,13	0,88
JB	89,34	10,26	0,92
FX	89,16	10,33	0,84
EM	88,91	10,66	0,94
UC	88,29	11,34	0,88
IL	88,11	11,26	0,93
GH	87,72	11,75	0,92
PG	87,48	11,88	0,85
ML	86,94	12,35	0,86
RN	86,54	12,69	0,92
EN	84,59	14,95	0,92

where South African mills are listed in order of decreasing Boiling House recovery.

DK reports the second highest Boiling House recovery (92,11) ever recorded in South Africa. It was only bettered by SZ in 1958 with 92,57. DL has the next highest recovery (91,95) and it is interesting to compare boiling house figures for these two mills which are listed in Table V. DK is favoured by higher juice purity which reduces the amount of molasses produced and consequently losses in molasses. Both factories achieve almost the same exhaustion in C Massecuite in spite of the fact that DL boils a far stiffer massecuite but at a lower purity. Reducing sugar ash ratio in final molasses is the same at both mills and the same final molasses purity could be expected. The higher purity of final molasses at DK is due to the fact that this mill cannot boil C massecuite at lower purity because the equipment cannot handle the high viscosity product.

TABLE V
Comparative Boiling House data of DK and DL

	DK	DL
Boiling house recovery	92,11	91,95
Mixed juice purity	88,95	87,38
C Massecuite purity	60,67	55,72
C Massecuite Brix	95,40	98,31
Exhaustion	60,25	59,59
Molasses 85 Bx % cane	2,68	3,09
Brix of final molasses	89,73	89,88
Purity of final molasses	39,21	36,56
Sucrose lost in molasses %		
Sucrose in cane	6,69	7,18
Sucrose lost in filter cake		
% Sucrose in cane	0,34	0,42
Undetermined losses		
% Sucrose in cane	0,36	0,13
Reducing Sugars/Ash ratio final molasses	0,99	0,96

This comparison illustrates the advantages that can be obtained from boiling house equipment designed to process viscous massecuites. It also shows that, at least in this case, the higher viscosity seems to reduce exhaustion and that there is diminishing return as purities of C massecuites are reduced. In spite of higher Brix and better crystallizing equipment and centrifugals DL obtains a purity drop of 21 points while DK has 22,7 points and DL cannot therefore reap the full benefit of boiling C massecuites 5 points lower in purity than those of DK.

In general Mozambique mills report better exhaustion of C massecuites than South African mills. Average for Mozambique was 57,29 and for South Africa 54,37, but Mozambique averages are affected by the mills which still use spindle Brix. MR reports a purity drop of 25 points between C massecuite and molasses.

Modifications carried out to boiling house equipment during the year has been designed mainly to enable mills to process more viscous massecuites. Conversion of crystallizers to continuous flow has been carried out in a number of mills and this principle has been extended to B massecuite crystallizers at

DL. A completely new C station has been commissioned at GH and new pans have been installed at EM, FX, RN and AK. Modifications carried out at UK enable C massecuite to flow continuously, by gravity, from the pans to the C sugar melter.

More continuous centrifugals have been installed for both B and C sugar in several mills. The ruggedness and simplicity of operation of continuous centrifugals has led some operators to neglect the full potential of these machines and in many cases both capacity and separation efficiency (as indicated by difference in purity between nutsch and final molasses) could be improved.

Two interesting developments have been made at FX. A storage tank for syrup and A and B molasses has been made by having horizontal separations in a large cylindrical tank and a cylindrical strike receiver has been used as the supporting structure for a pan.

Fuel

Calorific value of bagasse is listed in Table C and additional fuels and their bagasse equivalent in Table D.

Even after allowing for outside load and sale of bagasse to by-products processing plants, the additional fuel used by some mills reveals large variations in thermal efficiency.

This is illustrated by Figure 1, which is a block graph of total fuel consumption (bagasse plus additional) of each South African mill reduced to a common basis. The unit used for this comparison is kilojoules in fuel per kg of Brix in mixed juice. The lower part of the graph shows heat obtained from bagasse and the striped part heat from additional fuels.

A reference line has been drawn in each block to indicate approximate heat required if the factory process requirement was 55% steam on cane at a boiler efficiency of 70%. This is equivalent to 3,72 kg steam per kg Bx at 14,8 Brix in mixed juice per cent cane.

Several factories have important outside loads such as refineries, power for irrigation, by-products processing etc., and at FX and AK bagasse is used for paper and board manufacture respectively. The percentage of refined sugar produced is noted in the column for each mill producing white sugar and outside load is indicated by cross-stripes in the column for additional fuel.

Bagasse disposal costs money and in most mills, there is no incentive to save bagasse. This is illustrated by the case of UK, ME, JB, DL and EM where very little outside fuel is used and probably only for starting. AK manages to keep its outside fuel requirements to a low value although the factory supplies bagasse to a large board mill. At FX additional fuel is required to compensate for fibre supplied to the paper mill.

PG and particularly ML show good thermal efficiency and operate both refinery and raw house on less fuel than some of the raw sugar factories.

Chemical control

The 1972/73 season has seen the adoption of some modifications to the methods used for routine chemical control of sugar factories in South Africa. Most of these modifications are the result of changes in methods of analysis for cane payment. They are:

Pol in mixed juice which has replaced sucrose in mixed juice as the basis of factory control. This was done to facilitate routine analyses. It was felt that the small difference between pol and sucrose in mixed juice did not justify the additional time required for the sucrose analyses and that the procedure for sucrose determination was more liable to errors in routine work.

Brix in bagasse has traditionally been obtained by dividing pol in bagasse by purity of last expressed juice. This calculation was based on the assumption that residual juice in bagasse was of the same composition as last expressed juice and research carried out in South Africa and overseas had shown that this assumption was incorrect. Another error was introduced by practical difficulties in sampling last expressed juice.

The adoption of a standard method for bagasse analysis using cold disintegrators throughout the industry and the availability of precision refractometers in all laboratories has made it possible to calculate the Brix in bagasse from the Brix of the extract used for pol determination.

Values of Brix and purity of residual juice are listed in Table C1. Inspection of these results show that the differences between purities of last expressed and residual juice are not constant and also that there is no fixed relation between pol in bagasse and these two purities.

Suspended solids in Mixed Juice. A correction for the effect of suspended solids has been introduced during the season to the weight of Brix and pol in mixed juice. The weight of suspended solids is added to the weight of fibre in bagasse to obtain the weight of fibre in cane.

Fibre values therefore have been affected both by changes in determination of Brix in bagasse and by the suspended solids correction. This last measure has necessitated the adoption of two fibre values in mill control: fibre % cane which now includes suspended solids and fibre % bagasse which is only the vegetable fibre. Fibre % bagasse has been adopted as the fibre value to be used in mill control formulae.

Fibre values listed in Tables B and C have been calculated from Brix of residual juice but do not include suspended solids as this correction was applied during the middle of the season.

Lost Absolute Juice % Fibre. As stated earlier this has been the chemical control factor which has been the most affected by the changes discussed above and the net result of all changes has been to increase values of L.A.J. by about 20%. These changes have brought to light the dependence of L.A.J. on the purity of last expressed juice which is the least reliable analytical value in mill control.

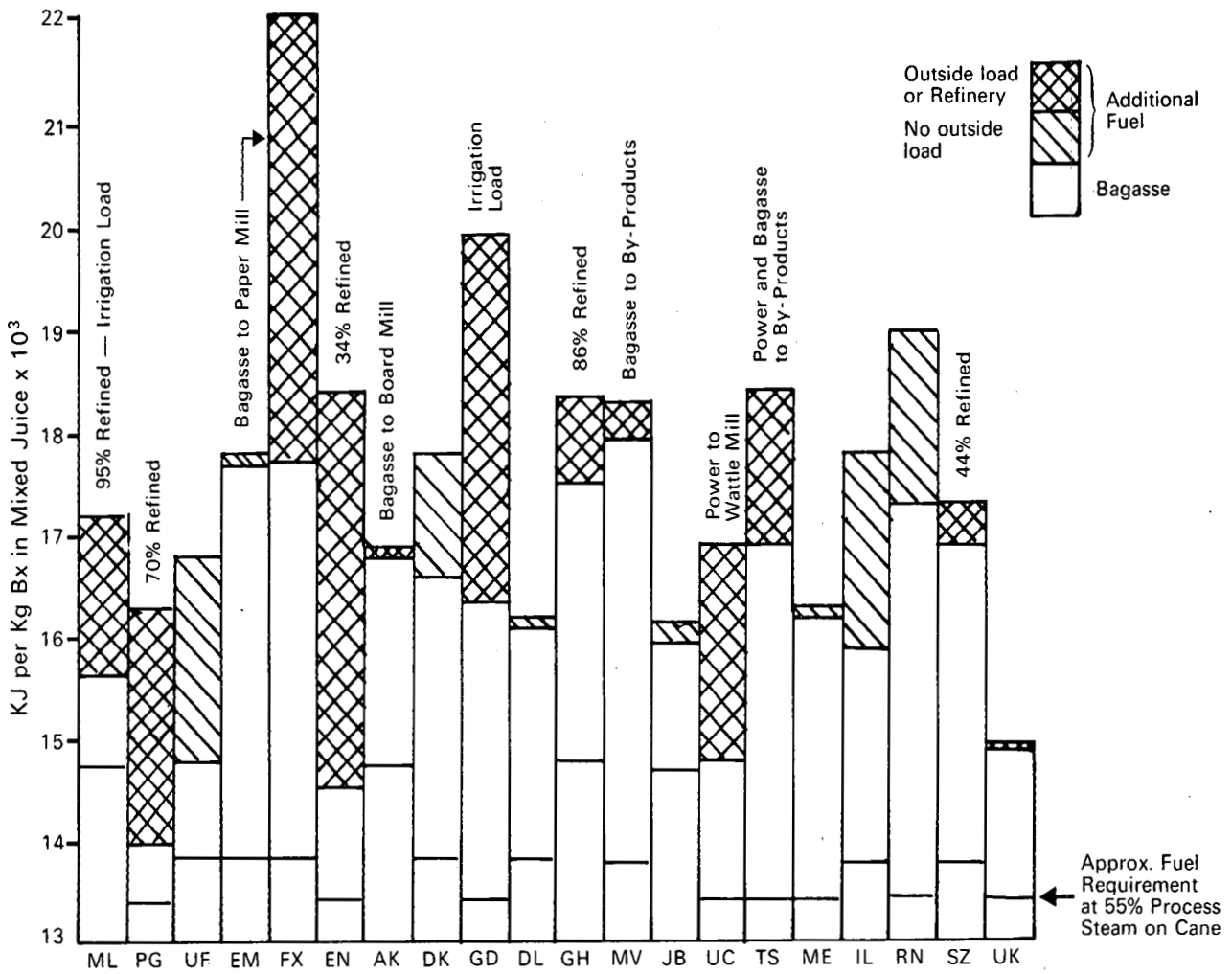


FIGURE 1: Heat content of fuels used per kilo of Brix in mixed juice.

The effects of these changes which have served to eliminate or reduce known inaccuracies in chemical control illustrate the dangers of relying on one factor to assess mill or boiling house performance.

Pol, Brix and Fibre factors. With the introduction of direct cane analysis for cane payment, three new mill control figures have become available. They are pol factor, Brix factor and fibre factor. By definition:

$$\text{Pol factor} = \frac{\text{kilos pol by mill mass balance}}{\text{kilos pol by direct cane analysis}}$$

and Brix and fibre factor are calculated in the same way.

These factors are listed in Table B1. They range from 1,00 to 0,94 for pol and from 1,089 to 0,959 for fibre. An industrial average has not been calculated because the factors do not apply to the complete season

in all mills. For factory control purposes the factors are useful in indicating possible inaccuracies in mill mass balance and could be used as a measure of "undetermined losses" which occur in the extraction plant. Viewed from this angle, the factors throw interesting light on the controversial issue of possible destruction of sugar in diffusers. Both the best and lowest factors are reported by diffusion factories and there does not seem to be any systematic difference which can be attributed to the process.

Acknowledgements

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TABLE A
SOUTH AFRICAN SUGAR ASSOCIATION FINAL PRODUCTION 1972/73 SEASON
 (Metric tons)

Mill	Local Market			Export Market			Total
	White	Refinery Raws	Brown	Very High Pol	H.T. Molasses (Sugar Equivalent)	Raws for Refined Export	
Malelane	112 551	—	5 454	—	—	—	118 005
Pongola	57 023	—	24 454	—	—	—	81 477
Umfolozi	—	2 640	8 950	126 487	—	—	138 077
Empangeni	—	126 376	242	4 440	—	—	131 058
Felixton	—	84 949	195	21 088	—	—	106 232
Entumeni	8 868	—	1 906	14 846	—	—	25 620
Amatikulu	—	26 452	244	166 958	—	—	193 654
Doornkop	—	3 320	126	41 020	—	—	44 466
Glendale	—	23 812	38	44	—	—	23 894
Darnall	—	33 868	269	64 464	—	45 075	143 676
Gledhow	122 440	21 104	64	—	—	6 122	149 730
Melville	—	14 637	2 706	24 166	—	—	41 509
Jaagbaan	—	—	—	93 927	—	—	93 927
Union Co-op	—	231	133	31 444	—	—	31 808
Tongaat	—	57 192	366	114 273	—	—	171 831
Mount	—	—	—	—	—	—	—
Edgecombe	—	32 946	32 716	—	34 525	—	100 187
Illovo	—	3 095	16 731	48 981 } Syrup 51 }	—	—	68 858
Renishaw	—	—	35 744	—	—	—	35 744
Sezela	47 688	263	125	76 705	—	12 449	137 230
Umzimkulu	—	—	82	77 536	—	—	77 618
Total	348 570	430 885	130 545	906 430	34 525	63 646	1 914 601

TABLE B1

**CANE CRUSHED AND SUGAR MADE, CANE COMPOSITION,
SOUTH AFRICAN MILLS**

SYMBOLS OF FACTORIES	ML	PG		UF		EM	FX		EN	AK
		A	B	A	B		A	B		
Tons sugar made**	118 005	81 477		138 077		131 058	106 232		25 620	193 654
Percentage of white sugar made	95	70		—		—	—		35	—
Average % pol of all sugars made	99,66	99,26		99,28		99,35	99,45		99,69	99,50
Tons crystal made	117 403	80 572		136 599		129 746	105 466		25 510	192 180
Tons of cane crushed Total	1 045 415	712 945		1 211 760		1 182 224	960 798		224 523	1 711 557
Tons of cane crushed (per tandem)		233 761	479 184	370 066	841 694		597 166	363 632		
Season started on	1.5.72	1.5.72		20.5.72		3.5.72	11.5.72		1.5.72	4.5.72
Season completed on	29.1.73	3.2.73		10.2.73		25.2.73	25.2.73		3.1.73	28.2.73
Number of crushing days	274	277		267		298	291		247	300
Time account										
Hours crushing % available hours	70,72	69,46	76,94	71,97	81,94	81,51	77,51	72,31	78,47	77,79
Hours scheduled stop % available hours	7,29	14,21	14,11	2,69	2,90	9,73	9,98	9,99	9,24	10,87
Hours lack of cane % available hours	10,88	7,36	2,09	11,62	1,16	4,15	5,98	11,45	4,21	3,96
Other hours of stoppages % available hours	11,11	8,97	6,86	13,72	14,00	4,61	6,53	6,25	8,08	7,38
Throughputs per hour actual crushing										
Tons of cane crushed	224,77	50,59	93,63	80,36	160,57	203,08	110,51	72,13	48,24	306,03
Tons of fibre in bagasse milled	33,24	6,70	12,56	11,32	21,51	32,76	16,57	12,06	6,75	43,96
Tons of Brix processed	34,45	22,11		36,12		29,43	26,43		7,32	44,24
Tons of sugar bagged	25,37	16,73		28,04		22,53	20,36		5,52	34,72
Composition of cane crushed										
Sucrose % cane	13,68	13,66		13,18		12,88	12,95		13,89	13,07
Fibre % cane	14,79	13,35		13,61		16,13	15,69		13,94	14,71
Brix % cane	16,49	16,29		15,66		15,31	15,46		15,84	15,85
Tons cane per ton sugar	8,86	8,75		8,78		9,01	9,03		8,74	8,81
Tons cane per ton of 96° sugar	8,53	8,46		8,48		8,71	8,72		8,42	8,50
Performances										
Imbibition % cane	42,34	41,16	34,00	46,47	35,71	45,85	43,92	44,60	43,55	38,81
Imbibition % fibre	286	311	253	330	267	284	284	279	312	264
Lost absolute juice % fibre	41	45	46	39	40	28	42	37	26	51
Java Ratio	80,85	80,63	81,57	—	—	76,31	79,24	73,57	80,17	79,25
Extraction	94,57	95,04	94,86	95,78	96,06	96,24	95,07	95,61	97,02	95,39
Fibre factor	1,004	—	—	0,983	0,999	0,986	0,971	1,066	1,022	1,040
Pol factor	1,001	—	—	0,992	1,003	0,985	0,985	0,977	0,992	0,967
Brix factor	1,011	—	—	1,032	1,038	1,001	1,010	1,010	1,009	0,973
Sucrose % fibre in bagasse	5,02	5,13	4,52	4,09	3,82	3,00	4,08	3,64	2,96	4,09
Boiling house recovery	86,94	87,48		89,44		88,91	89,16		84,59	90,50
Overall recovery	82,22	83,04		85,82		85,57	84,95		82,07	86,34
Sucrose balance										
Lost in bagasse (a)	5,43	5,08		4,04		3,76	4,72		2,98	4,60
Lost in filter cake (b)	0,25	0,92		0,62		0,22	0,66		1,44	0,31
Lost in final molasses (c)	10,10	8,57		9,23		9,29	8,84		9,85	8,40
Undetermined losses (d)	2,00	2,39		0,28		1,15	0,83		3,66	0,35
Boiling house losses (b)+(c)+(d)	12,35	11,88		10,13		10,66	10,33		14,95	9,06
Sum of all losses (a)+(b)+(c)+(d)	17,78	16,96		14,17		14,42	15,05		17,93	13,66

* Including sugar equivalent of HTM

** Figures supplied by S.A. Sugar Association

THROUGHPUTS AND TIME ACCOUNTS, PERFORMANCES AND LOSSES
(Season 1972 - 1973)

DK	GD	DL	GH	MV	JB	UC	TS		ME	IL	RN	SZ	UK	Totals and Averages
							A	B						
44 466	23 894	143 676	149 730	41 509	93 927	31 808	171 831		100 187*	68 858	35 744	137 230	77 618	1 914 601
99,51	99,38	99,50	99,88	99,39	99,50	99,69	99,50		98,88	99,35	98,35	99,64	99,56	99,46
44 132	23 669	142 583	149 490	41 126	93 204	31 658	170 491		98 483	68 156	34 848	136 474	77 051	1 898 882
383 443	206 967	1 211 147	1 355 177	361 882	809 174	285 574	1 513 748		874 900	606 056	319 329	1 190 691	637 336	16 804 645
							480 797 1 032 951							
3.5.72	23.5.72	4.5.72	13.5.72	11.5.72	17.5.72	25.4.72	6.5.72		3.5.72	13.4.72	18.5.72	1.5.72	9.5.72	13.4.72
24.2.73	21.2.73	25.2.73	24.2.73	25.1.73	17.12.72	23.12.72	2.2.73		14.1.73	11.2.73	18.1.73	6.1.73	9.12.72	28.2.73
299	275	297	288	259	214	242	271		256	303	244	253	212	268
74,17	73,14	81,63	80,74	75,64	79,04	82,30	75,32		76,48	78,78	72,44	80,36	78,71	77,00
15,89	13,96	8,96	14,17	14,39	9,92	11,89	7,31		16,33	9,78	15,08	14,30	14,37	11,06
3,12	9,06	5,25	1,22	5,24	3,65	0,60	9,54		5,44	7,09	3,42	3,24	4,76	5,30
6,82	3,84	4,16	3,87	4,73	7,39	5,21	7,82		1,75	4,35	8,95	2,10	2,16	6,64
72,12	42,81	208,15	242,41	77,04	199,56	59,63	98,20		186,21	105,73	75,17	243,86	158,86	169,51
10,51	6,20	30,53	37,34	11,77	29,64	7,97	14,87		27,76	15,29	11,56	36,82	22,54	25,12
10,45	6,24	30,58	34,77	10,58	29,76	8,76	42,04		27,11	15,63	10,91	35,48	24,41	24,78
8,60	4,94	24,69	26,76	8,46	23,16	6,66	33,71		21,36	11,99	8,41	28,10	19,37	19,32
13,36	13,52	13,37	13,14	13,09	13,42	13,01	13,01		13,12	13,51	13,48	13,31	13,93	13,26
14,17	14,49	14,66	15,40	15,97	14,85	13,36	15,01		14,90	14,46	15,37	15,10	14,19	14,82
15,54	15,76	15,68	15,48	15,31	15,75	15,46	15,19		15,40	15,97	15,75	15,69	16,30	15,69
8,62	8,66	8,43	9,06	8,71	8,61	8,95	8,81		8,72	8,81	8,93	8,68	8,20	8,77
8,36	8,36	8,13	8,71	8,42	8,31	8,62	8,50		8,46	8,52	8,72	8,36	7,91	8,47
35,43	40,31	48,19	35,81	43,42	49,99	30,43	32,70		48,84	33,61	36,59	45,38	49,18	41,35
250	278	329	232	272	336	228	211		328	232	238	300	347	279
57	45	37	40	33	30	32	46		31	44	43	41	35	39
78,19	79,15	80,09	79,96	79,70	78,17	—	78,31		78,56	78,18	78,15	79,37	79,63	78,96
93,74	93,94	96,02	95,68	95,64	96,31	96,92	94,14		96,27	94,69	94,37	95,67	96,34	95,55
—	0,970	0,991	1,019	1,018	1,087	—	0,959		1,028	1,074	1,030	1,040	1,036	—
—	1,002	0,989	0,991	0,992	0,979	0,940	0,966		0,965	0,954	0,965	0,959	0,987	0,981
—	1,014	0,982	1,008	1,016	0,998	—	1,001		0,989	0,962	0,982	0,978	1,001	0,989
5,90	5,65	3,62	3,68	3,57	3,34	2,99	5,05		3,28	4,96	4,94	3,81	3,59	3,98
92,11	90,39	91,95	87,72	91,07	89,34	88,29	91,29		89,77	88,11	86,54	90,18	90,44	89,48
86,35	84,91	88,30	83,93	87,10	86,04	85,57	86,78		86,42	83,43	81,67	86,28	87,13	85,50
6,26	6,06	3,97	4,31	4,35	3,69	3,08	4,94		3,73	5,31	5,63	4,32	3,66	4,45
0,34	0,30	0,42	0,78	0,39	0,56	0,44	0,58		0,38	0,40	0,92	0,28	0,20	0,48
6,69	8,21	7,18	9,10	7,72	8,57	9,16	7,57		7,90	9,34	9,25	7,61	7,15	8,46
0,36	0,51	0,13	1,87	0,44	1,13	1,74	0,13		1,56	1,52	2,52	1,50	1,87	1,11
7,39	9,02	7,73	11,75	8,55	10,26	11,34	8,28		9,84	11,26	12,69	9,39	9,22	10,05
13,65	15,08	11,70	16,06	12,90	13,95	14,42	13,22		13,57	16,57	18,32	13,71	12,88	14,50

TABLE C1
ANALYSIS OF BAGASSE, JUICES, FILTER
SOUTH AFRICAN MILLS

SYMBOLS OF FACTORIES	ML	PG		UF		EM	FX		EN	AK
		A	B	A	B		A	B		
Final bagasse										
Pol % bagasse	2,13	2,29	2,33	1,73	1,66	1,34	1,78	1,67	1,33	1,75
Moisture % bagasse	54,19	51,61	51,58	54,65	53,37	53,12	52,27	52,33	52,85	53,06
Fibre % bagasse	42,46	44,61	44,55	42,25	43,50	44,59	43,58	45,94	45,16	42,87
Bagasse % cane	34,82	29,67	30,11	33,34	30,80	36,17	35,42	34,75	30,98	34,31
LCV in kJ per Kg bagasse	6 813	7 325	7 330	6 738	6 998	7 062	7 214	7 206	7 116	7 056
First expressed juice										
Brix	19,53	19,39	19,16	—	—	18,92	18,42	20,12	19,16	18,69
Apparent purity	86,64	87,57	87,32	—	—	89,23	87,62	89,31	90,40	88,27
Last expressed juice										
Brix	2,63	—	—	—	—	1,87	—	—	—	1,59
Apparent purity	75,28	65,12	65,28	—	—	67,40	72,94	72,34	—	67,72
Purity drop	11,36	22,45	22,04	—	—	21,83	14,68	16,97	—	20,55
Residual juice purity	63,86	60,58	60,20	55,81	53,04	58,80	53,39	52,80	62,13	43,13
Purity drop	22,78	26,99	27,12	—	—	30,43	34,23	36,51	28,27	45,14
Mixed juice										
Mixed juice % cane	107,52	111,49	103,89	113,14	104,91	109,68	108,49	109,85	112,57	104,50
Brix	14,25	13,65	14,54	13,48	13,75	13,21	13,05	13,39	13,48	13,84
Apparent purity	84,42	85,51	85,71	85,81	86,41	85,60	85,90	86,00	88,10	86,26
Purity drop	2,20	2,06	1,61	—	—	3,63	1,72	3,31	2,30	2,01
Suspended solids % mixed juice	0,51	—	0,44	—	0,59	0,40	—	0,63	0,46	0,57
Reducing sugars / Sucrose ratio	6,28	—	4,84	—	4,15	4,00	—	4,40	2,49	4,06
Clarified juice										
Brix	14,60	13,71	—	13,24	—	13,07	12,07	—	13,82	13,22
Apparent purity	84,18	85,90	—	86,33	—	85,70	85,80	—	88,46	87,40
Reducing sugars / Sucrose ratio	6,00	4,54	—	3,94	—	3,20	4,40	—	2,45	3,85
Average pH	7,2	7,0	—	6,9	—	7,3	7,3	—	7,5	7,2
Filter cake										
Pol % filter cake	1,03	2,33	—	1,65	—	0,72	1,43	—	3,99	0,81
Filter cake % cane	3,33	5,38	—	5,00	—	4,05	6,00	—	5,00	5,00
Syrup										
Brix	61,17	63,89	—	60,95	—	62,13	62,75	—	64,14	63,61
Apparent purity	83,72	86,35	—	86,91	—	86,30	87,21	—	89,42	87,73
Reducing sugars / Sucrose ratio	6,72	3,67	—	4,24	—	2,80	3,90	—	1,94	3,30
Average pH	6,2	6,5	—	6,4	—	6,4	6,5	—	7,2	—
Final molasses										
Refracto Brix	85,52	83,92	—	89,14	—	89,60	87,01	—	81,04	90,05
Pol / Refracto Brix purity	37,71	41,08	—	39,46	—	38,80	40,00	—	47,23	38,99
Sucrose / Refracto Brix purity	40,45	40,01	—	41,37	—	38,31	40,82	—	47,09	39,78
Percentage reducing sugars	21,30	16,43	—	16,04	—	12,83	15,10	—	8,13	16,84
Percentage sulphated ash	11,84	—	—	15,83	—	16,36	15,40	—	9,59	12,03
Reducing sugars / ash ratio	1,80	—	—	1,01	—	0,78	0,98	—	0,85	1,40
Molasses of 85° Ref. Brix % cane	4,02	3,44	—	3,46	—	3,68	3,30	—	3,42	3,25

CAKE, SYRUP AND FINAL MOLASSES
(Season 1972 — 1973)

DK	GD	DL	GH	MV	JB	UC	TS		ME	IL	RN	SZ	UK	Totals and Averages
							A	B						
2,49	2,55	1,60	1,65	1,62	1,50	1,40	2,17	1,70	1,47	2,09	2,19	1,71	1,58	1,75
53,54	51,25	52,81	51,94	51,96	52,52	50,41	53,50	53,95	52,58	54,27	51,97	51,71	53,19	52,85
42,13	45,04	44,19	44,76	45,30	44,94	46,91	42,95	43,37	44,90	42,26	44,45	44,90	43,91	43,98
33,63	32,17	33,18	34,41	35,25	33,05	28,49	35,28	34,47	33,20	34,22	34,59	33,62	32,31	33,70
6 929	7 387	7 113	7 286	7 283	7 175	7 604	6 950	6 880	7 165	6 799	7 527	5 324	7 037	7 099
18,82	19,23	18,71	18,57	18,38	19,20	—	18,81	18,79	18,84	19,69	19,37	18,73	19,52	18,95
90,80	88,81	89,20	88,48	89,39	89,46	—	88,62	88,40	88,66	87,76	89,06	89,59	89,65	88,67
—	—	1,86	—	1,16	—	—	3,17	2,27	1,16	—	2,68	1,19	—	—
—	—	70,72	—	68,58	—	—	76,70	75,30	67,25	—	73,68	71,43	—	—
—	—	18,48	—	20,81	—	—	11,92	13,10	21,41	—	15,38	18,16	—	—
57,51	68,66	53,37	51,65	59,23	59,23	51,93	60,96	63,24	58,50	60,23	61,36	50,53	54,27	—
33,29	20,15	35,83	36,83	30,16	30,23	—	27,66	25,16	30,16	27,53	27,70	39,06	35,38	—
101,80	108,14	115,01	101,40	108,17	116,94	101,94	97,42	99,76	115,64	99,39	102,01	111,76	116,88	107,67
13,84	13,47	12,77	14,15	13,26	12,83	14,42	14,40	14,25	12,59	14,87	14,23	13,02	13,14	13,58
88,95	87,18	87,38	87,63	87,27	86,68	85,81	87,63	87,29	86,76	86,54	87,65	87,48	87,37	86,66
1,85	1,63	1,82	0,85	2,12	2,78	—	0,99	1,11	1,90	1,22	1,41	2,11	2,28	2,01
0,47	0,39	0,74	0,68	0,46	1,27	0,84	—	0,64	0,53	0,58	0,59	0,47	0,51	0,59
3,54	4,30	4,02	3,86	3,06	4,90	3,94	—	4,41	4,19	3,98	3,17	3,24	3,64	4,17
12,53	13,48	11,91	13,33	12,51	12,59	14,48	—	13,93	12,23	14,46	14,93	12,60	12,75	13,27
88,98	87,80	87,98	87,89	87,97	87,30	85,78	—	87,10	86,66	86,86	88,41	87,70	89,49	87,18
3,73	4,35	3,85	3,66	3,11	4,50	4,06	—	3,80	3,82	3,63	2,73	3,16	2,63	3,88
7,1	7,2	7,2	7,3	7,2	7,1	7,0	—	7,3	7,1	7,3	7,4	7,2	7,0	7,2
0,92	1,55	1,07	2,36	1,08	1,51	1,49	—	1,48	0,89	1,60	2,33	0,71	0,69	1,34
4,99	2,65	5,18	4,32	4,74	4,97	3,85	—	5,07	5,65	3,37	5,35	5,26	3,99	4,77
64,19	64,26	64,56	62,96	66,81	61,09	63,98	—	64,11	62,59	64,55	62,35	64,23	63,05	63,22
89,54	88,29	88,27	87,97	88,02	87,60	86,39	—	87,63	87,57	86,34	88,35	88,26	88,80	87,36
3,68	4,14	3,71	3,44	3,24	4,39	4,15	—	3,69	3,94	2,90	2,65	2,86	3,23	3,71
6,7	6,6	6,4	6,6	6,5	6,5	6,1	—	7,1	6,4	6,5	6,7	6,6	6,7	6,5
89,73	87,09	89,88	84,64	85,63	88,89	85,24	—	87,60	88,14	88,95	85,76	83,67	82,23	87,16
38,01	39,61	34,77	40,93	41,85	37,87	39,70	—	38,93	40,27	39,69	44,91	39,67	37,97	39,87
39,21	39,62	36,56	42,34	42,05	39,20	39,73	—	39,41	39,36	41,52	45,21	39,28	38,34	40,03
15,34	14,97	16,14	13,73	15,35	16,07	14,56	—	16,19	15,67	13,38	15,78	14,48	14,12	15,06
15,51	14,97	16,84	—	—	13,29	11,64	—	15,31	—	9,81	12,84	14,45	14,73	13,22
0,99	1,00	0,96	—	—	1,21	1,25	—	1,06	—	1,36	1,23	1,00	0,96	1,14
2,68	3,30	3,09	3,32	2,83	3,45	3,53	—	2,94	3,10	3,58	3,24	3,03	3,06	3,30

TABLE D1
MASSECUITES, EXHAUSTIONS, CLARIFYING
SOUTH AFRICAN MILLS

SYMBOLS OF FACTORIES	ML	PG	UF	EM	FX	EN	AK	DK	GD
Brix in mixed juice % cane	15,32	15,14	14,67	14,49	14,36	15,17	14,46	14,08	14,57
A-Massecuite									
m ³ per ton Brix in mixed juice	1,23	1,04	0,99	0,98	0,94	1,08	1,02	0,93	0,99
Brix of massecuite	91,28	91,38	91,33	93,11	92,38	91,45	94,58	92,94	91,79
Purity of massecuite	85,32	86,21	87,69	87,30	87,50	86,54	89,52	91,54	88,69
Purity of A-molasses	71,97	70,20	72,80	69,00	73,10	74,79	71,62	75,32	72,12
Purity drop	13,35	16,01	14,81	18,30	14,40	11,75	17,90	16,22	16,57
Exhaustion*	55,82	62,31	62,09	67,62	61,18	53,86	70,46	71,80	67,01
Purity A mc—Purity syrup	1,60	—0,14	0,78	1,00	0,29	—2,8	1,79	2,00	0,40
B-Massecuite									
m ³ per ton Brix in mixed juice	0,45	0,35	0,33	0,34	0,32	0,50	0,28	0,29	0,38
Brix of massecuite	93,39	91,56	91,31	95,81	93,51	95,37	94,24	93,66	92,14
Purity of massecuite	71,97	74,66	72,20	69,70	73,10	75,57	72,54	75,81	72,13
Purity of B-molasses	49,94	55,18	51,90	51,40	51,30	55,81	49,09	56,33	51,29
Purity drop	22,03	19,48	20,30	18,30	21,80	19,76	23,45	19,48	20,84
Exhaustion*	61,15	58,21	58,45	54,02	61,24	59,17	63,50	58,84	59,31
C-Massecuite									
m ³ per ton Brix in mixed juice	0,29	0,32	0,26	0,27	0,26	0,25	0,25	0,24	0,22
Brix of massecuite	95,89	95,17	93,55	98,52	95,72	95,31	96,36	95,40	94,57
Purity of massecuite	58,20	60,63	59,58	57,20	60,50	61,16	59,75	60,67	56,19
Purity of C-molasses	37,71	41,08	39,46	38,80	40,00	47,09	38,99	38,01	39,61
Purity drop	20,49	19,55	20,12	18,40	20,50	14,07	20,76	22,66	16,58
Crystal % massecuite	32,89	33,18	33,23	30,06	34,17	26,59	34,02	36,55	27,45
Exhaustion*	56,52	54,73	55,78	52,56	56,47	43,48	56,95	60,25	48,86
White sugar massecuites									
Kgs sugar per m ³	611	756	—	—	—	—	—	—	—
Total volume of all raw massecuites									
m ³ per ton Brix in mixed juice	1,97	1,71	1,57	1,60	1,52	1,83	1,55	1,47	1,59
Clarifying agents									
Tons limestone per 1 000 T.C.	—	4,80	—	—	—	—	—	—	—
Tons coke per 1 000 T.C.	—	0,49	—	—	—	—	—	—	—
Tons lime per 1 000 T.C.	2,09	—	0,63	0,90	0,60	1,16	0,51	0,45	0,61
Tons sulphur per 1 000 T.C.	0,02	0,01	—	—	—	—	—	—	—
Phosphoric acid ppm mixed juice	—	—	—	—	—	55	—	—	—
Flocculents ppm mixed juice	1,77	0,92	5,34	1,93	—	7,91	0,23	5,06	1,65
Additional fuels									
<i>Per 1 000 Tons of Cane</i>									
Tons of coal	8,67	13,67	10,57	0,37	21,54	16,92	0,39	—	16,24
Tons of fuel oil	—	—	—	—	—	—	—	15,38	—
Tons of wood	—	—	—	0,76	0,44	12,94	—	8,18	3,06
Converted into bagasse***	34,68	54,67	42,30	2,39	86,68	83,20	2,03	25,22	68,68

$$* \text{ Exhaustion} = \frac{10000 (\text{Pty massecuite} - \text{Pty run off})}{\text{Pty massecuite} (100 - \text{Pty run off})}$$

$$** \text{ Crystal content} = \frac{10000 (\text{Pty massecuite} - \text{Pty run off})}{100 - \text{Pty run off}}$$

AGENTS AND ADDITIONAL FUELS

(Season 1972 - 1973)

DL	GH	MV	JB	UC	TS	ME	IL	RN	SZ	UK	Totals and Averages
14,69	14,34	14,35	14,91	14,69	14,16	14,56	14,78	14,51	14,55	15,36	14,62
1,03	1,04	1,06	1,09	1,05	1,04	1,05	1,20	0,73	1,09	0,98	1,03
93,30	92,09	91,51	91,57	92,40	92,90	92,17	S 93,05	90,23	90,68	91,19	92,07
89,24	91,20	89,50	88,50	87,14	88,10	88,06	88,19	87,04	88,27	88,92	88,22
73,15	75,30	73,30	73,60	72,14	72,80	74,70	S 72,44	72,21	72,75	74,56	72,89
16,09	15,90	16,20	14,90	15,00	15,30	13,36	15,75	14,83	15,52	14,36	15,33
67,15	70,58	67,79	63,77	61,79	63,85	59,97	64,80	61,31	64,52	63,48	64,10
0,97	3,23	1,48	0,90	0,75	0,47	0,49	1,85	-1,31	0,01	0,12	0,86
0,28	0,35	0,29	0,35	0,54	0,41	0,39	0,34	0,39	0,33	0,35	0,37
94,48	92,73	92,10	93,02	93,38	92,90	93,00	S 93,26	90,52	91,80	92,47	93,03
72,92	75,98	73,80	75,80	71,47	72,70	74,16	74,32	76,16	74,43	74,59	73,70
47,63	55,38	50,00	53,40	50,04	52,90	53,44	51,45	57,27	51,74	54,33	52,49
25,29	20,60	23,80	22,40	21,43	19,80	20,72	22,87	18,89	22,69	20,26	21,21
66,22	60,76	64,50	63,42	60,02	57,82	60,01	63,38	58,04	63,17	59,47	60,57
0,23	0,27	0,24	0,30	0,25	0,23	0,25	0,32	0,27	0,26	0,27	0,23
98,31	94,28	93,88	95,74	94,71	94,70	96,34	S 96,72	92,36	95,75	94,33	95,38
55,72	61,96	60,70	60,40	56,92	57,00	61,93	61,35	62,91	59,69	59,35	59,59
34,77	40,93	41,85	37,87	39,70	38,93	40,27	39,69	44,91	39,67	37,97	39,87
20,95	21,03	18,85	22,53	17,22	18,07	21,66	21,66	18,00	—	21,38	19,72
32,12	35,60	32,42	34,59	28,56	29,59	36,26	35,91	32,67	33,18	34,47	32,80
57,64	57,46	53,40	60,04	50,17	51,91	58,55	58,54	51,94	55,59	58,07	55,03
—	757	—	—	—	—	—	—	—	530	—	—
1,54	1,66	1,59	1,74	1,85	1,68	1,69	1,86	1,39	1,69	1,60	1,65
—	4,99	—	—	—	—	—	—	—	2,93	—	—
—	—	—	—	—	—	—	—	—	0,29	—	—
0,49	1,24	0,55	0,66	0,74	0,38	0,55	0,39	0,55	1,43	0,50	—
—	0,01	—	—	—	—	—	—	—	0,01	—	—
—	—	—	197	237	—	—	—	—	—	—	—
0,20	1,81	2,05	7,60	4,12	0,59	0,38	7,95	7,36	1,65	1,06	—
—	3,21	1,29	—	9,23	7,83	0,02	7,68	—	2,14	—	—
—	—	—	—	—	—	—	—	—	0,03	—	—
0,94	1,06	0,70	3,38	0,63	0,40	—	8,92	6,29	0,16	0,26	—
1,13	14,12	5,98	4,06	37,66	31,80	0,09	41,43	7,62	8,95	0,32	—

*** 1 m³ fuel oil is equivalent to 5,5 tons of bagasse of 6 978 kJ/Kg.
 1 ton fuel oil is equivalent to 6 tons of bagasse of 6 978 kJ/Kg.
 1 ton coal is equivalent to 4 tons of bagasse of 6 978 kJ/Kg.
 1 ton firewood is equivalent to 1,2 tons bagasse of 6 978 kJ/Kg.

TABLE B2
CANE CRUSHED AND SUGAR MADE, CANE COMPOSITION, THROUGHPUTS AND TIME ACCOUNTS, PERFORMANCES
AND LOSSES
(MOZAMBIQUE, SWAZILAND AND MALAWI MILLS)
(Season 1972 - 1973)

SYMBOLS OF FACTORIES	LB	MR	AM	BZ	IC	MA	Totals & Averages	MH	UR	NH
Tons sugar made	75 901	77 853	63 224	36 618	45 053	27 503	326 152	89 663	81 753	33 764
Percentage of white sugar made	26	45	27	32	39	45	35	Nil	26	39
Average °pol of all sugar made	98,81	99,10	98,28	98,18	98,87	98,54	98,69	98,55	98,89	97,07
Tons crystal made	74 421	76 747	61 612	—	44 260	26 846	319 466	87 726	80 314	32 525
Tons of cane crushed	693 195	654 399	566 081	356 931	400 685	265 346	2 936 636	772 295	734 108	318 822
Season started on	5.5.72	3.5.72	13.6.72	21.5.72	18.5.72	28.7.72	3.5.72	29.4.72	5.5.72	5.5.72
Season completed on	9.11.72	4.12.72	15.12.72	22.12.72	12.12.72	30.1.73	30.1.73	22.12.72	29.12.72	10.12.72
Number of crushing days	187	215	185	217	209	184	200	236	236	218
Time account										
Hours crushing % available hours	85,30	81,27	71,14	72,58	70,53	48,54	71,86	83,04	83,26	71,81
Hours scheduled stop % avail. hrs.	3,69	6,47	13,67	14,83	14,93	8,71	10,49	4,69	7,13	11,24
Hours lack of cane % avail. hrs.	8,54	5,03	4,43	4,19	6,77	12,36	6,76	8,24	4,70	4,10
Other hrs. of stoppages % avail. hrs.	2,48	7,23	10,76	8,40	7,76	30,39	10,89	4,02	4,90	12,85
Throughputs per hour actual crushing										
Tons of cane crushed	181,18	156,01	179,58	94,43	113,44	124,00	142,38	164,46	154,78	85,03
Tons of fibre milled	26,64	23,30	25,61	13,86	16,21	17,01	20,79	23,39	20,95	14,62
Tons of Brix processed	25,33	24,18	28,26	14,55	16,35	19,17	21,39	24,41	23,42	12,07
Tons of sugar bagged	19,84	18,56	20,06	9,69	12,76	12,85	15,81	19,09	17,24	9,01
Composition of cane crushed										
Sucrose % cane	12,99	14,56	13,74	13,21	13,33	13,89	13,64	13,52	13,33	13,00
Fibre % cane	14,70	15,40	14,17	15,20	14,29	13,72	14,60	14,22	13,53	17,20
Brix % cane	15,13	17,21	17,02	15,94	15,78	16,91	16,48	15,93	16,08	15,31
Tons cane per ton of sugar	9,13	8,40	8,95	9,75	8,89	9,65	9,00	8,61	8,98	9,44
Tons cane per ton of 96° sugar	8,87	8,14	8,74	9,53	8,63	9,40	8,76	8,39	8,72	9,34
Performances										
Imbibition % cane	25,61	30,37	38,72	25,48	28,10	26,99	29,64	31,23	29,44	40,28
Imbibition % fibre	174	197	273	168	197	197	203	219	217	234
Lost absolute juice % fibre	44	55	46	66	52	54	52	41	38	35
Java Ratio	—	—	80,73	77,34	79,23	78,54	79,22	80,17	80,48	77,78
Extraction	93,19	90,92	93,86	91,40	91,92	92,04	92,29	93,61	95,07	92,99
Sucrose % fibre in bagasse	6,01	8,58	5,95	7,74	7,54	8,06	7,19	6,07	4,86	5,30
Boiling house recovery	89,36	89,06	85,11	83,43	90,70	79,86	87,06	90,43	86,87	85,00
Overall recovery	83,27	80,98	79,88	76,25	83,37	73,50	80,36	84,66	82,58	79,04
Sucrose balance										
Lost in bagasse (a)	6,81	9,08	6,14	8,60	8,08	7,96	7,70	6,39	4,93	7,01
Lost in filter cake (b)	0,39	0,40	0,37	0,48	0,21	1,40	0,47	0,33	0,13	1,25
Lost in final molasses (c)	8,21	8,29	11,61	10,25	7,62	12,19	9,42	7,54	10,15	9,36
Undetermined losses (d)	1,31	1,25	1,99	4,42	0,72	4,95	2,05	1,08	2,20	3,33
Boiling house losses (b)+(c)+(d)	9,91	9,94	13,97	15,15	8,55	18,54	11,94	8,95	12,48	13,94
Sum of all losses (a)+(b)+(c)+(d)	16,72	19,02	20,11	23,75	16,63	26,50	19,64	15,34	17,41	20,95

TABLE C2
ANALYSIS OF BAGASSE, JUICES, FILTER CAKE, SYRUP AND FINAL MOLLASSES
(MOZAMBIQUE, SWAZILAND AND MALAWI)
(Season 1972 - 1973)

SYMBOLS OF FACTORIES	LB	MR	AM	BZ	IC	MA	Totals and Averages	MH	UR	NH
Final bagasse										
Pol % bagasse	2,52	3,62	2,72	3,39	5,38	3,39	3,11	2,69	2,15	2,16
Moisture % bagasse	54,75	53,16	50,18	50,31	50,90	53,53	52,42	52,33	52,64	56,66
Fibre % bagasse	41,96	42,15	45,67	43,82	44,80	42,03	43,26	44,28	44,26	40,07
Bagasse % cane	35,04	36,54	31,02	33,50	31,90	32,63	33,76	32,12	30,58	42,25
LCV in kJ per Kg bagasse	66,84	69,58	75,95	75,40	74,22	68,93	71,28	71,64	71,24	63,16
First expressed juice										
Brix	C.L.	C.L.	20,49	20,61	19,33	20,61	20,31	19,57	19,59	19,17
Apparent purity	C.L.	C.L.	83,06	82,05	87,07	84,86	84,19	86,14	83,89	86,80
Last expressed juice										
Brix	4,39	4,16	—	5,84	4,50	2,87	4,35	3,81	2,24	5,03
Apparent purity	76,77	76,77	—	67,47	78,61	75,61	75,05	79,25	70,06	81,71
Purity drop	—	—	—	14,58	8,46	9,25	9,14	6,89	13,83	5,09
Mixed juice										
Mixed juice % cane	90,57	93,84	107,70	91,98	96,20	94,36	95,88	99,10	98,86	98,03
Brix	15,44	16,52	14,61	16,60	14,98	16,31	15,67	14,97	15,30	14,48
Apparent purity	86,60	85,41	81,93	78,31	85,05	82,84	83,80	85,26	83,44	84,72
Purity drop	—	—	1,13	3,74	4,78	2,02	—	0,88	0,45	2,08
Reducing sugars / Sucrose ratio	4,71	3,26	8,10	9,13	5,29	5,70	5,65	4,07	5,38	4,13
Clarified juice										
Brix	15,53	15,66	13,70	16,32	14,82	16,52	15,43	14,34	14,46	14,42
Apparent purity	86,80	85,50	83,28	81,92	85,83	84,14	84,58	87,00	84,24	87,24
Reducing sugars / Sucrose ratio	4,23	3,38	7,19	7,94	4,79	5,70	5,20	3,50	5,41	3,48
Average pH	7,0	7,0	—	6,9	7,1	7,1	7,0	7,1	7,1	7,4
Filter cake										
Pol % filter cake	1,25	1,17	1,62	1,80	0,73	3,89	1,56	1,64	0,36	3,21
Filter cake % cane	4,10	5,01	3,18	3,55	3,85	5,00	4,10	2,76	4,65	5,06
Syrup										
Brix	69,50	62,17	65,46	58,23	59,28	59,38	63,39	64,14	61,89	60,29
Apparent purity	86,40	85,98	82,97	84,27	86,12	82,14	84,95	85,93	84,18	85,69
Reducing sugars / Sucrose ratio	3,96	2,95	7,20	6,64	4,74	6,72	5,03	3,53	5,34	3,73
Average pH	6,7	6,7	7,2	—	6,4	5,9	6,6	6,7	6,4	6,7
Final molasses										
Refracto Brix	86,37	86,45	S 91,27	87,31	S 93,89	S 87,34	88,65	89,79	S 93,15	83,43
Pol / Refracto Brix purity	—	—	S 40,09	40,46	S 38,13	S 43,60	—	—	S 36,95	41,39
Sucrose / Refracto Brix purity	43,51	41,11	—	—	38,64	—	41,19	39,29	39,52	42,56
Percentage reducing sugars	15,38	22,86	18,04	—	18,15	13,22	17,53	17,54	19,15	10,46
Percentage sulphated ash	12,91	—	—	—	13,53	14,97	—	—	14,3	—
Reducing sugar / Ash ratio	1,19	—	—	—	1,34	0,88	—	—	1,34	—
Molasses of 85° Ref. Brix % cane	2,88	3,45	S 4,68	3,93	S 3,09	S 4,59	3,67	3,05	4,03	3,36

S= Spindle Brix.

TABLE D2
MASSECUITES, EXHAUSTIONS, CLARIFYING AGENTS AND ADDITIONAL FUELS
(MOZAMBIQUE, SWAZILAND AND MALAWI MILLS)
(Season 1972 - 1973)

SYMBOLS OF FACTORIES	LB	MR	AM	BZ	IC	MA	Totals and Averages	MH	UR	NH
Brix in Mixed Juice % Cane	13,98	15,50	15,74	15,40	14,41	15,46	15,02	14,84	15,13	14,20
A-Massecuite										
m ³ per ton Brix in mixed juice	0,83	0,79	0,94	0,70	0,91	0,85	0,84	1,10	0,94	0,83
Brix of massecuite	93,28	92,41	S 92,48	92,12	S 92,17	S 92,65	92,52	92,13	S 91,34	90,97
Purity of massecuite	85,39	84,84	80,64	82,98	84,93	83,32	83,68	85,51	86,90	85,57
Purity of A molasses	70,91	68,66	64,44	66,14	68,61	65,36	67,35	69,66	70,13	66,40
Purity drop	14,48	16,18	16,20	16,84	16,32	17,96	16,33	15,85	16,77	19,17
Exhaustion	58,29	60,85	56,49	59,94	61,22	62,23	59,84	61,09	64,61	66,67
Purity A mc—Purity syrup	-1,41	-1,14	-2,33	-1,29	-0,12	1,18	-0,86	-0,42	2,72	-0,12
B-Massecuite										
m ³ per ton Brix in mixed juice	0,40	0,46	0,37	0,38	0,37	0,38	0,39	0,44	0,38	0,41
Brix of massecuite	94,72	94,87	S 93,10	91,77	S 94,78	S 94,10	93,89	93,01	S 93,33	92,75
Purity of massecuite	73,09	73,64	73,39	74,54	74,02	74,18	73,81	73,77	74,16	74,86
Purity of B molasses	53,91	53,49	59,20	55,58	53,44	59,11	55,79	50,21	50,83	52,44
Purity drop	19,18	20,15	14,19	18,96	20,58	15,07	18,02	23,56	23,33	22,42
Exhaustion	56,94	58,83	47,39	57,26	59,71	49,68	54,97	64,14	63,98	62,97
C-Massecuite										
m ³ per ton Brix in mixed juice	0,31	0,28	0,32	0,28	0,23	0,26	0,28	0,25	0,33	0,28
Brix of massecuite	98,64	99,40	S 97,76	94,64	S 97,83	S 96,26	97,42	94,90	S 97,14	96,00
Purity of massecuite	60,57	60,24	62,12	61,41	61,78	63,68	61,63	60,98	61,21	58,78
Purity of C molasses	40,04	34,90	40,09	40,46	38,13	43,60	39,54	39,29	36,95	41,39
Purity drop	20,53	25,34	22,03	20,95	23,65	20,08	22,10	21,69	24,26	17,39
Crystal % massecuite	34,24	38,92	36,77	35,19	38,22	35,60	36,49	35,73	38,46	29,67
Exhaustion	56,53	64,62	50,49	57,30	61,87	55,91	57,79	58,59	62,87	50,48
White sugar massecuites										
Kgs sugar per m ³	—	654	625	—	—	—	—	—	498	654
Total volume of all raw massecuites										
m ³ per ton Brix in mixed juice	1,55	1,53	1,62	1,36	1,51	1,49	1,51	1,79	1,65	1,51
Clarifying agents										
Tons limestone per 1 000 T.C.	—	—	—	—	—	—	—	—	—	—
Tons coke per 1 000 T.C.	—	—	—	—	—	—	—	—	—	—
Tons lime per 1 000 T.C.	1,45	1,26	1,48	1,50	1,31	0,99	—	0,95	1,15	1,71
Tons sulphur per 1 000 T.C.	0,18	0,01	—	0,07	0,32	—	—	—	0,001	—
Phosphoric acid ppm mixed juice	—	0,5	17,71	—	2,85	1,19	—	—	—	*102
Flocculents ppm mixed juice	0,18	3,58	7,05	0,24	1,87	6,39	—	0,40	1,75	2,75
Additional fuels										
<i>(Per 1 000 Tons of Cane)</i>										
Tons of fuel oil	0,04	4,2	—	—	—	—	—	—	—	—
Tons of coal	0,92	1,37	0,003	—	—	0,03	—	2,27	12,59	—
Tons of wood	7,13	12,36	0,26	0,03	—	—	—	—	—	4,41
Converted into bagasse**	12,49	45,59	0,33	0,04	—	0,13	—	9,08	50,37	5,29

* Used in refining of melt.

TABLE E
COMPARATIVE MANUFACTURING DATA OF RECENT YEARS
(South African Mills)

SEASON	1972/73	1971/72	1970/71	1969/70	1968/69
CANE					
Sucrose % cane	13,26	12,97	13,61	12,88	13,11
Fibre % cane	14,82	14,82	15,34	15,03	15,32
JUICES					
Brix of first expressed juice	18,95	18,55	20,10	19,00	19,54
Purity of first expressed juice	88,67	86,83	86,83	86,08	85,49
Purity of mixed juice	86,66	85,14	84,99	84,25	83,60
Reducing sugar/sucrose ratio	4,17	4,20	3,80	4,17	4,23
MILLING					
Imbibition % fibre	279	277	285	274	268
Imbibition % cane	41,35	41,05	43,17	41,22	41,12
Extraction	95,55	95,91	95,41	94,98	94,97
Pol % bagasse	1,75	1,61	1,80	1,89	1,98
Moisture % bagasse	52,85	52,66	53,07	53,30	53,52
Bagasse % cane	33,70	32,97	34,61	34,18	34,93
Lower calorific value of bagasse kJ/Kg.	7 099	7 143	7 052	7 005	6 997
Available kJ in bagasse per Kg Brix mixed juice	16 183	16 119	15 967	16 479	16 444
RECOVERIES					
Boiling house recovery	89,48	89,41	88,57	88,58	87,40
Overall recovery	85,50	85,76	84,51	84,13	82,72
Tons cane per ton sugar	8,77	8,93	8,64	9,10	9,06
FILTER CAKE					
Pol % filter cake	1,34	1,34	1,46	1,58	2,08
Filter cake % cane	4,77	4,73	4,82	4,49	4,71
FINAL MOLASSES					
GRAVITY PURITY					
Degree Brix	40,03	39,40	38,94	38,43	39,40
Weight at 85° Brix % cane	87,16	88,16	91,82	91,37	91,81
	3,30	3,26	3,69	3,55	3,78
AVERAGE SUGAR POLARISATION					
	99,46	99,36	99,38	98,68	98,42
SUCROSE BALANCE					
Lost in filter cake	0,48	0,49	0,51	0,55	0,77
Lost in final molasses	8,46	8,43	8,96	9,01	9,64
Undetermined losses	1,11	1,23	1,43	1,29	1,51
LOST IN BOILING HOUSE	10,05	10,15	11,05	10,85	11,92
Lost in bagasse	4,45	4,09	4,59	5,02	5,36
TOTAL OF ALL LOSSES	14,50	14,24	15,64	15,87	17,28
m³ MASSECUITE PER TON BRIX MIXED JUICE					
A-Massecuite	1,03	1,02	1,00	0,94	0,91
B-Massecuite	0,37	0,35	0,36	0,36	0,36
C-Massecuite	0,23	0,26	0,27	0,28	0,29
TOTAL	1,65	1,63	1,63	1,58	1,56
EXHAUSTION OF MASSECUITES					
A-Massecuite	64,10	63,38	64,75	65,01	64,73
B-Massecuite	60,57	60,72	61,06	60,96	60,35
C-Massecuite	55,03	56,85	55,21	56,25	56,15
PURITY RISE					
A-Massecuite purity	88,22	87,60	87,66	87,11	86,26
Syrup purity	87,36	86,53	86,37	85,45	84,92
Rise	0,86	1,07	1,29	1,66	1,34
BRIX OF SYRUP					
	63,22	62,53	62,12	61,03	61,23

TABLE F1
AVERAGE MANUFACTURING RESULTS BY MONTHLY PERIODS FOR SOUTH AFRICAN MILLS
 (Season 1972 - 1973)

END OF MONTHLY PERIOD	Month	May 27 1972	July 1 1972	July 29 1972	Sept. 2 1972	Sept. 30 1972	Oct. 28 1972	Dec. 2 1972	Dec. 30 1972	Jan. 27 1973	Feb. 27 1973
TONS SUGAR MADE AND ESTIMATED	Month To-date	(115 387) (115 387)	(245 780) (361 168)	216 364 (577 532)	286 430 (863 961)	229 015 (1 092 977)	(213 794) (1 306 771)	(267 659) (1 574 429)	(157 041) (1 731 471)	123 503 (1 854 364)	56 872* (1 914 601)
TONS CANE CRUSHED	Month To-date	1 112 607 1 112 607	2 264 746 3 377 354	1 891 039 5 268 393	2 429 765 7 698 156	1 879 046 9 577 204	1 768 908 11 346 108	2 219 984 13 560 094	1 407 643 14 973 734	1 193 573 16 167 306	592 630 16 804 645
TONS CANE CRUSHED PER HOUR ACTUAL CRUSHING	Month To-date	149,34 149,34	164,93 159,44	170,73 163,32	169,84 165,32	167,01 165,65	165,92 167,14	165,96 167,45	161,45 166,87	167,82 166,94	170,43 169,51
SUCROSE % CANE	Month To-date	12,12 12,12	12,57 12,42	13,17 12,69	13,61 12,98	14,09 13,20	14,07 13,33	14,02 13,45	13,10 13,41	12,22 13,33	11,53 13,26
FIBRE % CANE	Month To-date	14,54 14,54	14,27 14,36	14,40 14,38	14,55 14,43	14,55 14,45	15,00 14,54	15,28 14,66	15,52 14,74	15,77 14,81	15,73 14,82
TONS CANE PER TON 96° SUGAR	Month To-date	9,31 9,31	8,90 9,03	8,45 8,81	8,19 8,60	7,92 8,46	7,98 8,38	8,00 8,32	8,69 8,35	9,33 8,42	10,03 8,47
LOST ABSOLUTE JUICE % FIBRE	Month To-date	40 40	40 40	38 39	37 39	39 39	40 39	31 38	44 38	33 38	46 39
IMBIBITION % FIBRE	Month To-date	284 284	277 280	279 279	278 279	283 280	283 280	277 280	276 279	273 279	277 279
SUCROSE EXTRACTION	Month To-date	95,55 95,55	95,88 95,77	95,81 95,79	95,68 95,75	95,71 95,75	95,53 95,71	95,46 95,67	95,14 95,62	94,85 95,57	95,27 95,55
SUCROSE % BAGASSE	Month To-date	1,62 1,62	1,60 1,61	1,69 1,64	1,78 1,68	1,82 1,71	1,84 1,73	1,85 1,75	1,78 1,76	1,76 1,76	1,52 1,75
MOISTURE % BAGASSE	Month To-date	53,34 53,34	52,87 53,03	52,64 52,89	52,73 52,84	52,71 52,82	52,64 52,79	52,86 52,80	52,86 52,81	53,30 52,85	52,80 52,85
BOILING HOUSE RECOVERY	Month To-date	88,99 88,99	89,53 89,36	90,03 89,61	90,02 89,76	89,88 89,78	89,45 89,73	89,59 89,71	88,62 89,61	88,81 89,56	87,11 89,48
OVERALL RECOVERY	Month To-date	85,03 85,03	85,84 85,58	86,26 85,83	86,14 85,95	86,03 85,96	85,45 85,88	85,52 85,82	84,31 85,68	84,24 85,59	83,00 85,50
MIXED JUICE PURITY	Month To-date	85,92 85,92	86,62 86,40	87,05 86,64	87,21 86,83	86,96 86,86	87,14 86,90	87,18 86,95	86,17 86,88	85,15 86,76	83,97 86,66
R.S./SUCROSE RATIO	Month To-date	4,34 4,34	4,17 4,29	4,13 4,23	3,78 4,08	4,07 4,08	3,86 4,04	3,53 3,62	4,38 4,04	5,25 4,12	5,12 4,17
PURITY OF FINAL MOLASSES	Month To-date	38,35 38,35	39,45 39,08	39,48 39,22	40,13 39,52	39,93 39,60	40,56 39,76	40,81 39,95	41,69 40,12	40,30 40,08	38,81 40,03
SUCROSE LOST IN FINAL MOLASSES % SUCROSE IN CANE	Month To-date	8,50 8 50	8,11 8,24	7,78 8,07	7,95 8,03	8,16 8,05	8,46 8,12	8,58 8,20	9,33 8,30	9,70 8,40	10,44 8,46
UNDERTERMINED LOST SUCROSE % SUCROSE IN CANE	Month To-date	1,51 1,51	1,46 1,48	1,34 1,43	1,16 1,33	1,06 1,27	1,13 1,25	0,86 1,18	0,91 1,16	0,35 1,10	1,34 1,11

Figures between brackets include the sugar equivalent of H.T.M.

* Figure supplied by S.A. Sugar Association

TABLE F2
AVERAGE MANUFACTURING RESULTS BY MONTHLY PERIODS FOR MOZAMBIQUE MILLS
 (Season 1972 - 1973)

END OF MONTHLY PERIOD	Month	July 29 1972	September 2 1972	September 30 1972	October 28 1972	December 2 1972	December 30 1972	FINAL
TONS SUGAR MADE AND ESTIMATED	Month	39 016	51 230	49 538	60 922	38 897	13 709	—
	To-date	78 991	130 221	198 379	259 301	246 790	286 871	326 152
TONS CANE CRUSHED	Month	355 092	435 608	407 407	509 798	334 771	145 975	—
	To-date	746 514	1 182 122	1 772 022	2 281 820	2 189 842	2 539 035	2 936 636
TONS CANE CRUSHED PER HOUR ACTUAL CRUSHING	Month	150,23	165,63	157,18	144,91	123,92	130,12	—
	To-date	150,01	155,41	146,95	146,49	137,33	153,82	142,38
SUCROSE % CANE	Month	13,16	14,01	14,56	14,55	14,15	12,71	—
	To-date	12,81	13,25	13,55	13,77	13,71	13,74	13,64
FIBRE % CANE	Month	14,31	14,62	14,71	14,67	15,45	14,99	—
	To-date	13,83	14,13	14,32	14,40	14,68	14,59	14,60
TONS CANE PER TON 96° SUGAR	Month	8,84	8,25	7,99	8,15	8,38	10,37	—
	To-date	9,18	8,81	8,68	8,56	8,62	8,60	8,76
LOST ABSOLUTE JUICE % FIBRE	Month	49	48	50	50	53	67	—
	To-date	50	49	50	50	52	49	52
IMBIBITION % FIBRE	Month	195	205	209	214	188	219	—
	To-date	192	197	197	201	187	207	203
SUCROSE EXTRACTION	Month	92,58	92,63	92,30	92,27	92,69	92,50	—
	To-date	92,68	92,66	92,53	92,47	92,97	92,43	92,29
SUCROSE % BAGASSE	Month	2,93	3,07	3,30	3,32	3,29	3,05	—
	To-date	2,89	2,96	3,05	3,11	3,20	3,08	3,11
MOISTURE % BAGASSE	Month	53,23	52,48	52,27	52,29	52,15	52,15	—
	To-date	53,50	53,11	52,71	52,61	52,98	52,67	52,42
BOILING HOUSE RECOVERY	Month	89,13	89,65	89,38	87,73	88,24	79,55	—
	To-date	88,11	88,71	88,20	88,09	88,32	87,82	87,06
OVERALL RECOVERY	Month	82,52	83,05	82,50	80,96	80,91	72,79	—
	To-date	81,66	82,20	81,62	81,46	81,24	81,18	80,36
MIXED JUICE PURITY	Month	84,61	86,04	85,63	84,76	84,41	80,90	—
	To-date	83,75	84,63	84,30	84,41	84,60	84,67	83,80
R.S./SUCROSE RATIO	Month	4,74	3,93	4,33	5,18	5,05	7,83	—
	To-date	5,44	4,85	4,90	4,96	4,67	5,13	5,65
PURITY OF FINAL MOLASSES	Month	44,08	41,51	40,94	41,91	42,09	41,29	—
	To-date	42,91	41,22	40,99	41,21	41,60	41,29	41,19
SUCROSE LOST IN FINAL MOLASSES % SUCROSE IN CANE	Month	9,17	8,31	7,54	9,07	8,81	12,50	—
	To-date	9,40	8,97	8,71	8,80	8,47	9,17	9,42
UNDETERMINED LOST SUCROSE % SUCROSE IN CANE	Month	0,51	0,93	1,91	1,69	1,41	5,36	—
	To-date	1,22	1,11	1,82	1,79	1,80	1,62	2,05

TABLE G
CANE VARIETIES
 (Season 1972 - 1973)

SYMBOLS OF FACTORIES	ML	PG	UF	EM	FX	EN	AK	DK	GD	DL	GH	MV	JB	UC
CANE VARIETIES														
CRUSHED														
N.Co. 376	65,7	37,1	9,8	19,1	43,5	70,6	22,0	80,3	56,0	81,0	66,4	48,2	12,4	3,5
N.Co. 310	17,9	60,4	63,9	15,1	29,6	1,1	0,8	0,7	5,4	1,7	1,9	1,8	0,2	0,5
N.Co. 293	—	0,2	—	—	—	18,8	0,2	5,4	2,8	—	0,6	0,1	55,0	71,0
N. 50/211	—	—	0,2	—	0,4	0,6	0,2	0,5	0,9	0,5	1,1	0,1	0,4	0,1
N.Co. 382	0,9	0,3	12,9	0,7	6,8	2,5	0,1	3,9	1,0	0,2	2,4	0,2	23,8	20,5
Co 331	—	—	0,1	—	—	—	—	0,1	6,6	0,3	—	—	4,7	3,3
N.Co. 339	—	—	1,0	—	0,3	—	—	—	—	0,1	—	—	—	—
N.Co. 292	—	—	0,2	—	—	—	—	—	—	—	0,1	—	—	—
N.Co. 334	5,2	—	—	—	—	—	—	0,7	—	—	0,1	0,6	—	—
Co. 301	—	—	0,2	—	—	—	—	—	—	—	—	—	—	—
UBA	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Co. 281	—	—	—	—	—	—	—	—	—	—	—	—	—	—
N 51/539	—	—	0,3	—	—	—	—	—	—	0,1	0,2	—	—	—
N51/168	0,1	—	0,8	0,1	0,3	—	0,1	—	0,1	—	0,2	0,2	—	—
POJ	—	—	—	—	0,9	—	—	—	—	—	—	—	—	—
N53/216	—	—	0,3	—	2,2	1,0	0,2	1,9	1,8	0,2	1,7	—	0,4	0,1
N52/219	—	—	—	—	—	—	0,1	—	—	—	—	—	—	—
CB 36/14	—	0,5	1,2	0,1	0,8	0,3	—	0,9	0,1	0,2	0,4	—	0,1	—
CB 38/22	—	0,1	0,5	—	—	—	—	—	—	—	—	—	—	—
N55/805	—	0,3	8,5	3,2	9,3	4,4	1,9	5,1	15,3	8,3	11,8	1,8	0,4	—
N/6	—	—	—	—	0,3	0,2	—	—	—	0,2	0,1	—	—	—
Mixed Varieties	9,9	0,8	—	61,0	4,9	—	73,9	—	9,4	6,6	12,4	46,6	2,0	1,1
Rainfall during 1972 (in mm)	837	584	1 054	1 044	1 753	1 237	1 113	1 010	726	1 051	761	762	747	768

AND RAINFALL

TS	ME	IL	RN	SZ	UK	Average South African Mills	LB	MR	AM	BZ	IC	MA	MH	UR	NH
68,6	45,4	49,0	85,8	80,2	88,5	49,8	—	50,1	100,0	97,7	64,2	—	72,1	66,3	28,2
2,8	3,9	4,2	2,4	2,4	1,3	12,5	—	28,6	—	2,3	21,3	—	22,9	22,5	70,9
0,8	2,8	27,1	—	1,6	5,3	5,9	—	—	—	—	—	—	—	—	—
3,8	3,1	1,3	0,1	0,3	—	0,9	—	—	—	—	—	—	—	—	—
2,5	1,2	9,5	3,6	1,9	0,1	4,2	—	20,0	—	—	—	—	—	—	0,1
0,1	0,1	—	—	—	0,1	0,4	—	—	—	—	—	—	—	—	—
0,6	—	0,1	—	—	—	0,1	—	—	—	—	—	—	—	—	—
—	—	0,8	0,5	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	0,4	—	—	—	—	—	—	3,9	4,6	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
0,3	—	—	0,3	—	—	0,1	—	—	—	—	—	—	—	—	—
0,7	0,4	0,2	—	0,6	—	0,3	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1,2	1,3	1,4	0,1	1,3	—	0,8	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
0,9	0,2	0,8	—	2,2	0,1	0,5	—	—	—	—	—	—	0,1	0,6	—
—	—	—	—	0,1	—	—	—	—	—	—	—	—	—	0,4	0,1
12,2	—	4,1	5,6	2,8	3,9	5,9	—	—	—	—	—	—	0,8	3,9	—
0,1	12,4	—	1,1	0,1	—	0,1	—	—	—	—	—	—	—	—	—
4,8	28,3	0,9	—	5,7	—	17,8	—	—	—	—	—	—	0,2	1,7	0,2
796	945	769	919	1 044	818	—	685	734	1 068	774	934	1 115	1 065	683	500

TABLE H
TRANSPORT SUMMARY SOUTH AFRICAN MILLS
(SEASON 1972 - 1973)

Percent of cane transported

	ML	PG	EM	FX	EN	AK	DK	GD	DL	GH	MV	JB	TS	ME	IL	RN	SZ	UK	Average*	UF	UC
South African Railways	24,5	—	30,5	59,7	—	13,7	—	—	—	16,1	—	19,3	—	22,0	4,7	16,0	18,8	—	15,0	30,3	11,4
Bogey trucks (narrow gauge)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	20,6	—	—	—	0,8	} 67,5	
Tram	—	100,0	37,4	40,2	—	—	39,1	—	—	—	—	—	—	—	1,5	—	—	—	11,1		
Hilo and Trailer	75,4	—	12,7	—	—	62,4	—	14,1	75,7	75,9	42,3	80,6	90,9	62,5	72,9	59,1	75,8	56,7	56,1	} 2,2	88,6
Lorry	—	—	—	—	99,9	2,4	22,2	40,8	11,5	4,3	43,9	—	4,0	15,4	—	1,2	4,8	33,8	8,2		
Tractor	—	—	19,2	—	—	21,3	38,6	44,9	12,7	3,5	13,7	—	4,9	—	—	23,5	0,4	9,4	8,5		

* Average does not include UF and UC.

TABLE J
COMPARATIVE DATA OF REPORTING S.A. MILLS FROM 1925 ONWARDS

Period (Season)	Percent Cane		Cane/Sugar Ratio		Extraction	Lost Absol. Juice % Fibre	Percent Bagasse		Imbibition Percent		Mixed Juice		Final Molass. Purity	Boiling House Recovery	Overall Recovery
	Sucrose	Fibre	Tel Quel	96 Pol Sugar			Pol	Moisture	Cane	Fibre	Purity	Reducing Sugar Ratio			
Average 1925-1934	13,19	15,78	9,86	9,64	89,83	58	3,88	50,57	27,6	175	85,09	3,65	45,3	83,67	75,12
Average 1935-1944	13,53	15,30	8,96	8,73	92,05	49	3,11	51,60	32,6	213	86,01	3,22	43,3	88,36	81,34
1945	14,28	15,99	8,29	8,08	93,28	39	2,77	50,19	35,0	219	86,23	3,38	42,0	89,29	83,30
1946	14,21	16,21	8,36	8,14	93,07	40	2,79	50,32	35,2	217	85,86	3,30	41,8	89,12	82,94
1947	13,32	15,80	8,84	8,60	93,94	40	2,54	50,46	34,4	218	86,24	2,95	41,1	89,61	83,73
1948	13,89	15,90	8,55	8,31	93,32	40	2,67	50,53	34,1	214	85,92	3,67	41,5	89,14	83,19
1949	13,52	16,19	8,76	8,52	92,94	41	2,66	50,84	33,7	208	86,22	3,11	41,4	89,68	83,35
1950	14,19	15,80	8,32	8,09	93,33	39	2,72	51,22	32,8	206	86,40	3,12	40,5	89,63	83,65
1951	13,33	16,29	8,98	8,73	92,98	40	2,57	51,71	35,0	215	84,92	3,52	40,3	88,72	82,50
1952	13,87	16,10	8,50	8,27	93,00	41	2,65	52,53	34,9	217	86,25	2,92	39,3	89,96	83,66
1953	13,93	16,31	8,55	8,32	92,67	42	2,75	52,47	32,7	200	85,61	3,66	39,5	89,36	82,81
1954	13,34	16,03	8,87	8,65	92,40	44	2,75	52,92	30,7	191	85,86	3,28	39,3	90,04	83,20
Average 1945-1954	13,79	16,06	8,60	8,36	93,04	41	2,69	51,32	33,8	210	85,95	3,29	40,7	89,46	83,23
1955	13,87	15,74	8,51	8,28	92,32	45	2,91	53,18	32,1	204	85,96	3,40	39,6	90,51	83,56
1956	13,35	15,81	8,87	8,62	92,93	42	2,60	53,12	35,2	222	85,49	3,32	39,9	89,79	83,44
1957	13,11	15,38	8,93	8,67	93,36	41	2,47	53,06	34,5	224	85,10	3,69	38,5	90,43	84,42
1958	13,12	15,92	9,09	8,82	92,87	42	2,55	52,38	32,9	207	84,46	4,30	39,1	89,49	83,11
1959	13,66	15,92	8,74	8,44	92,86	43	2,66	53,26	34,6	218	85,52	3,51	40,3	89,42	83,04
1960	13,69	15,22	8,70	8,41	93,35	42	2,60	53,01	36,2	238	85,63	3,31	40,3	89,40	83,45
1961	13,75	14,52	8,51	8,26	94,21	39	2,43	52,54	36,7	253	86,04	3,31	39,5	89,72	84,53
1962	13,29	15,49	8,97	8,73	94,15	37	2,24	52,17	41,2	266	83,36	5,11	39,6	87,81	82,67
1963	13,55	15,50	8,66	8,42	94,08	37	2,29	52,46	39,8	258	85,30	3,44	39,4	89,60	84,30
1964	13,90	15,38	8,42	8,20	94,16	37	2,34	52,64	39,4	256	85,52	3,32	39,9	89,65	84,42
Average 1955-1964	13,53	15,49	8,75	8,49	93,43	41	2,51	52,78	36,3	235	85,24	3,67	39,6	89,58	83,69
1965	12,99	15,57	9,20	8,97	93,99	38	2,20	52,98	40,6	261	84,22	3,73	39,9	87,67	82,40
1966	13,72	15,09	8,63	8,40	94,22	38	2,29	53,52	39,6	262	85,06	3,63	40,6	88,38	83,27
1967	12,92	15,01	9,28	9,06	94,15	38	2,19	53,47	39,2	261	83,41	3,81	38,8	87,52	82,33
1968	13,11	15,32	9,06	8,83	94,74	34	1,98	53,32	41,1	268	83,60	4,23	39,4	87,40	82,72
1969	12,88	15,03	9,10	8,86	94,98	34	1,89	53,30	41,2	274	84,25	4,17	38,3	88,58	84,13
1970	13,61	15,34	8,64	8,34	95,41	31	1,80	53,07	43,2	285	84,99	3,80	38,9	88,57	84,51
1971	12,97	14,82	8,93	8,63	95,91	29	1,61	52,66	41,1	277	85,14	4,20	39,4	89,41	85,76
1972	13,26	14,82	8,77	8,47	95,55	39	1,75	52,85	41,3	279	86,66	4,17	40,0	89,48	85,50