SEVENTIETH ANNUAL REVIEW OF THE MILLING SEASON IN SOUTHERN AFRICA (1994-1995)

GRE LIONNET

Sugar Milling Research Institute, Durban

Abstract

Performance and throughput data for the sugar industries in South Africa, Swaziland, Malawi, Zambia and Zimbabwe are presented and discussed. Drought conditions persisted throughout the season but the regions were affected differently. Generally the results in South Africa were somewhat better than those achieved in 1993/94, but still well below the pre-drought levels. Ash in cane continued to be a problem. Various developments at the clarification/filter station are discussed; improvements in terms of control having been realised at one factory. A falling film evaporator has operated successfully throughout the season at PG. Boiling house recovery is still low with high losses of sucrose in molasses and it is shown that this is due to the amount of molasses produced rather than to poor exhaustion work. Finally, refined sugar colour shows a marked improvement when compared to previous results. This is attributed to the efficient use of decolourising chemicals.

The cane crop

Cane variety and transport

The proportion of N12 being crushed in the Midlands continues to increase, having reached 72% and 74% at UC and NB respectively. The total amount of N12 now crushed (24,8%) is approaching the value (28,1) for NCo 376, which is still the most popular variety in South Africa. The next most important variety is N14 which forms about 70% of the crush at KM and ML, but only 47% at PG. N19 accounts for most of the remaining crush at ML, KM and PG.

NCo 376 and N14 are the most popular varieties in Swaziland, Malawi and Zimbabwe. Detailed information regarding the varietal distributions are given in Table G. The usual data regarding type of vehicle and mode of transport are given in Table H.

Burning

The trend towards increasing percentages of burnt cane continued this season, with an industrial average of 87,8% of the cane crop having been burnt, as opposed to 84% last season. ML, KM, PG, UF, EN and NB received between 98% and 100% of their cane burnt. Only SZ and DL received about 30% of their crops as trashed cane. The percentages of burnt cane at each factory and for the industry have been included in Table G.

Cane quality

General

The 1994/95 season in South Africa was the third consecutive one to be affected by drought. The severe impact on mixed juice purity, sucrose % dry matter in cane and cane tonnage is evident in Figure 1. These three parameters have improved with respect to the 1993/94 season but the values are still well below the pre-drought levels.

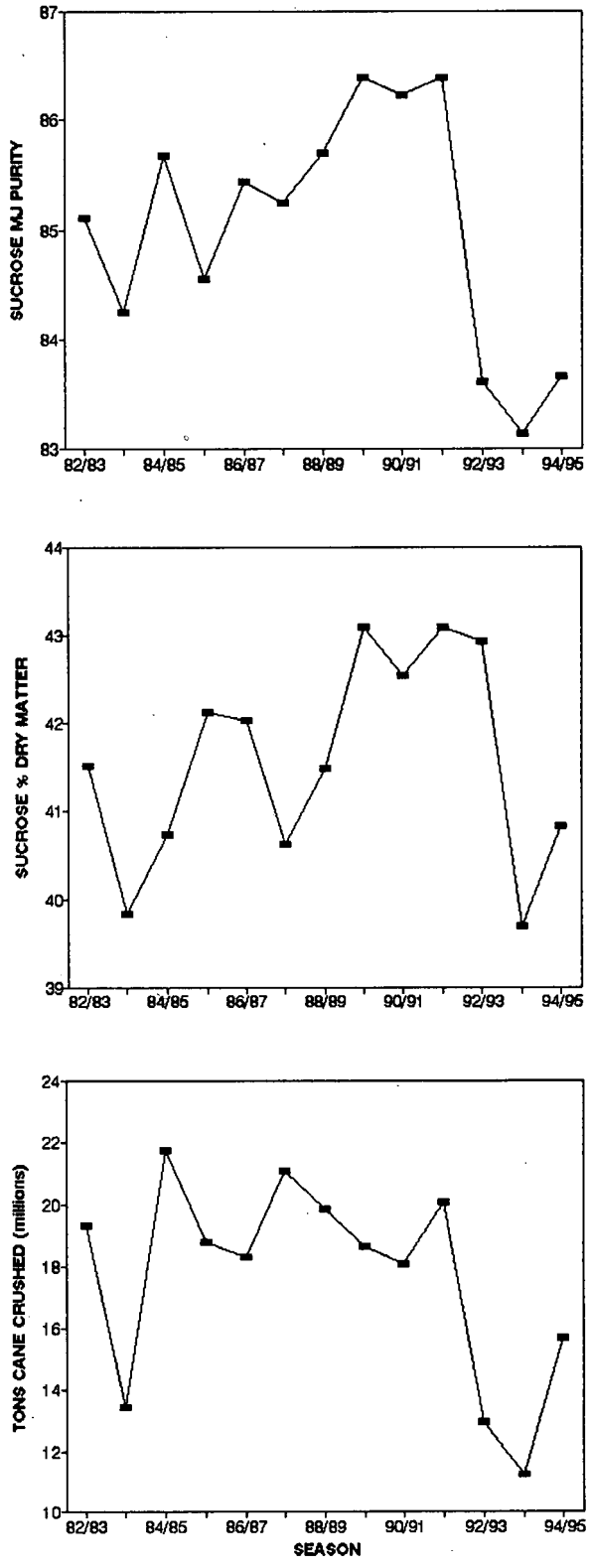


FIGURE 1 Mixed juice purity, sucrose % dry matter in cane and cane tonnage for the South African sugar industry over the last twelve seasons.

Sucrose % cane was 12,54, a slight improvement over the 1993/94 value. Moisture % cane was, however, more normal at 69,3 resulting in an improved value (40,8) for sucrose % dry matter in cane. Fibre % cane at 15,49 is well below last season's value, but still high with respect to the trend before the droughts.

Comparison between the 1994/95 and 1993/94 seasons

The industrial results show that there have been improvements in cane quality, with respect to last season. The changes at selected factories, in terms of mixed juice purity, sucrose and fibre % cane and cane tonnages, are shown in Tables 1, 2, 3 and 4.

Table 1

Changes in mixed juice purity, 1994/95 versus 1993/94

Factory	Mixed juice/purity	Difference
SZ	83,20 / 80,36	+ 2,84
NB	87,06 / 84,84	+ 2,22
MS	82,76 / 80,57	+ 2,19
GH	82,61 / 80,48	+ 2,13
UC	87,16 / 85,65	+ 1,51
UK	82,92 / 81,57	+ 1,35
ML	83,51 / 85,73	− 2,22
GD	82,68 / 83,69	− 1,01

Table 2

Changes in sucrose % cane, 1994/95 versus 1993/94

Factory	Sucrose % cane	Difference
SZ	12,52 / 12,11	+ 0,41
MS	11,76 / 11,40	+ 0,36
UF	12,89 / 12,59	+ 0,30
GH	11,72 / 11,45	+ 0,27
GD	12,03 / 12,73	− 0,70
ME	12,57 / 13,03	− 0,46
UC	13,88 / 13,88	− 0,26

Table 3

Changes in fibre % cane, 1994/95 versus 1993/94

Factory	Fibre % cane	Difference
SZ	16,26 / 18,80	− 2,54
EN	14,70 / 16,30	− 1,60
UF	14,62 / 15,91	− 1,29
GH	16,21 / 17,40	− 1,19
ME	15,13 / 16,18	− 1,05
GD	14,93 / 14,56	+ 0,37

Table 4

Changes in cane tonnages, 1994/95 versus 1993/94'

Factory	Tons cane	Difference
UK	856994 / 190426	+ 666568
NB	1108230 / 568488	+ 539742
GH	1146039 / 683496	+ 462543
SZ	1898876 / 1443639	+ 455237
FX	1619122 / 1210534	+ 408588
ML	990304 / 1359177	− 368875

SZ generally shows the best improvements. This is due mainly to better quality cane diversions to that factory and does not represent an improvement for the industry. Conditions have worsened at both ML and GD due to the more severe drought related effects.

Ash % cane

Ash in cane has again been a serious problem, with the industrial value being 1,74%. The trends for the last fifteen seasons are shown in Figure 2. GH (3,57%) and UF (2,03%) reported the highest levels. Ash % cane for the KwaZulu Natal North Coast mills (MS, GH, DL, AK, FX and UF) is compared to the average for PG, ML, NB, UC and UK in Figure 3. It is evident that the North Coast mills have had higher levels of ash, particularly later in the season.

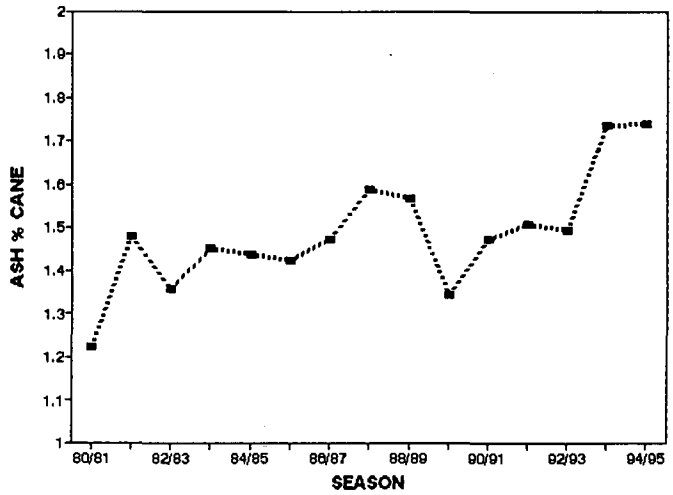


FIGURE 2 Ash % cane in the South African sugar industry over the last fifteen seasons.

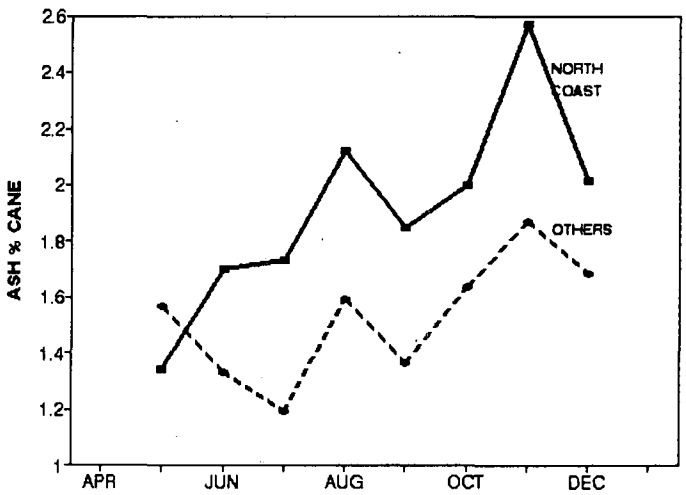


FIGURE 3 Ash % cane for the North coast mills.

Ash % bagasse can be approximated from ash % cane. Ash results available for the period 1989/90 to 1994/95 have been used to test this and in all cases significant relationships were obtained. Equation 1 and Figure 4 are typical results, using the data from cane diffusion only, for the 1994/95 season.

Ash % bagasse = -0,80 + 1,7 × Ash % cane Eq (1)

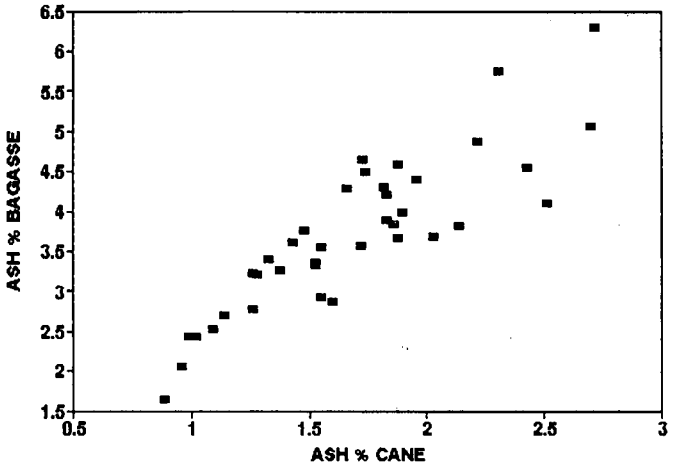


FIGURE 4 Relation between ash % bagasse and ash % cane. Cane diffusers, 1994/95 season.

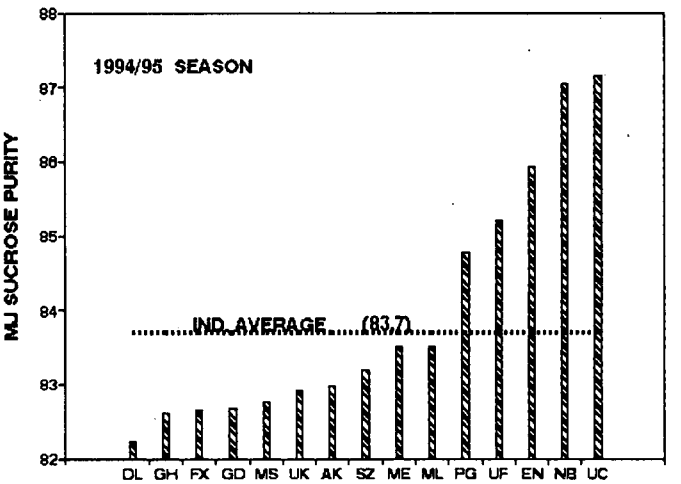


FIGURE 6 Mixed juice purities at the individual factories.

Equation 1 applies to 39 observations and has a correlation coefficient of 0,86. These data have been used to generate Table 5 and Figure 5.

Mixed juice purity at individual factories

Mixed juice purities for the individual factories in 1994/95 are shown in Figure 6. It is evident that the industry is divided into two main groups: ten factories below the average and five well above. Inspection of more detailed data shows that the difference between the low and high mixed juice purities is mostly at the beginning and the end of the season.

Table 5

Ash % bagasse for various ash % cane, for cane diffusers only

Ash % cane	Ash % bagasse
1,0	2,5 ± 0,3
1,5	3,4 ± 0,2
2,0	4,3 ± 0,2
2,5	5,1 ± 0,3
3,0	6,0 ± 0,5
3,5	6,9 ± 0,6

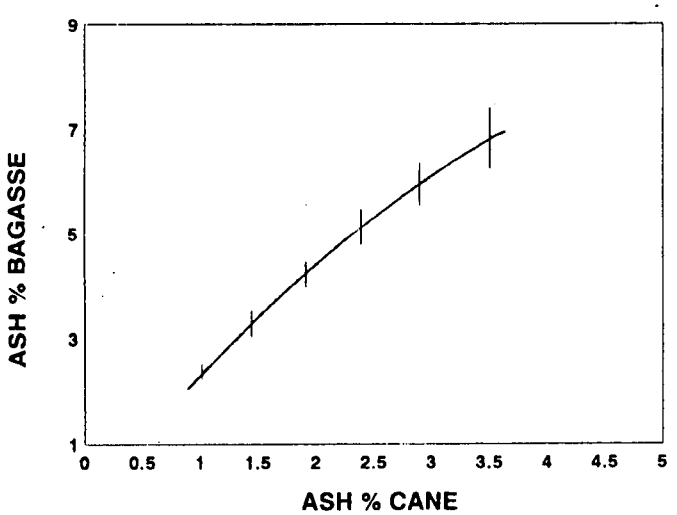


FIGURE 5 Ash in bagasse as a function of ash in cane, including 5% confidence intervals, for diffusers.

KM reported the lowest mixed juice purity (80,06) for the season and yet the factory had no special processing problems. The low cane throughput must have contributed to the absence of problems but other factors are present:

- Delays from burning to crushing at KM were short with the mill often running out of cane.
- The cane supply is relatively close to the mill. The furthest farm is 30-40 km away.
- About 60% of the cane at KM has been growing on virgin or fallow land. This type of soil normally yields good tonnages, but lower purities because of an excess of available nitrogen.

Eldana and cane deterioration

Eldana infestations have been a problem at a number of factories this season. UK, GD and MS reported high infestations, particularly at the end of the season. At AK, although cane quality was poor, eldana was not a problem this season.

Weekly ethanol data (ppm on brix, in DAC extracts) from three factories crushing burnt cane only have been plotted against time in Figure 7.

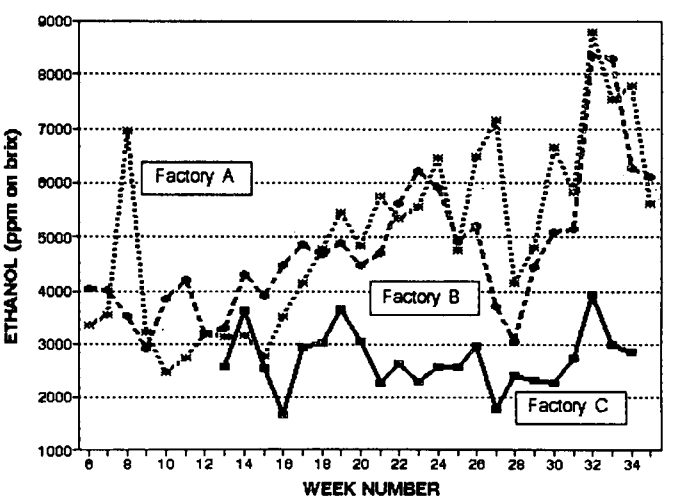


FIGURE 7 Weekly ethanol concentrations in DAC extracts at three factories.

Two observations may be made:

- Factory C shows lower levels of ethanol, throughout the season. The average is about 2500 ppm.
- The usual increase in ethanol during the summer months is not present at Factory C.

Cane quality in Southern Africa

Cane quality for the five countries covered in this report is summarised in Table 6. Pol based data have been used, since only South Africa analyses for sucrose. The effects of the drought in South Africa are clearly evident. Swaziland, with irrigation, chemical ripening and burning achieved the highest quality.

Table 6

A comparison of cane quality in Southern Africa, for the 1994/95 season

	Pol % cane	Fibre % cane	Mixed juice pol purity
South Africa	12,34	15,49	82,4
Swaziland	14,27	13,98	86,1
Malawi	13,28	15,42	85,0
Zimbabwe	13,99	14,50	85,9
Zambia	13,71	16,20	86,0

Cane cleaning

The KM rock and sand removal plant (Du Plooy, 1994) operated throughout the season. It successfully removed rocks and sand from the whole stalk, 100% burnt cane that arrived at KM. It is still too early to comment in detail on the design and performance of this equipment. The following general points can, however, be made:

- Some development is still envisaged with respect to wear on the tynes.
- With rainy conditions, field mud tends to cause chokes.
- The separation of cane stalks from the rock removal conveyor needs attention.
- KM has reported the lowest (0,04%) level of suspended solids in mixed juice, in the South African industry. This appears to have affected the amount of mud formed during clarification and, as a result, the filter station.

Mill performance

Throughputs and sugar production

The tonnages of cane crushed and sugar produced in the region are shown in Table 7. The Nakambala sugar factory in Zambia is now affiliated to the SMRI and its data are included. The tonnages in South Africa are lower than expected due to the drought while those of the other regions are normal.

Table 7
Cane and sugar tonnages

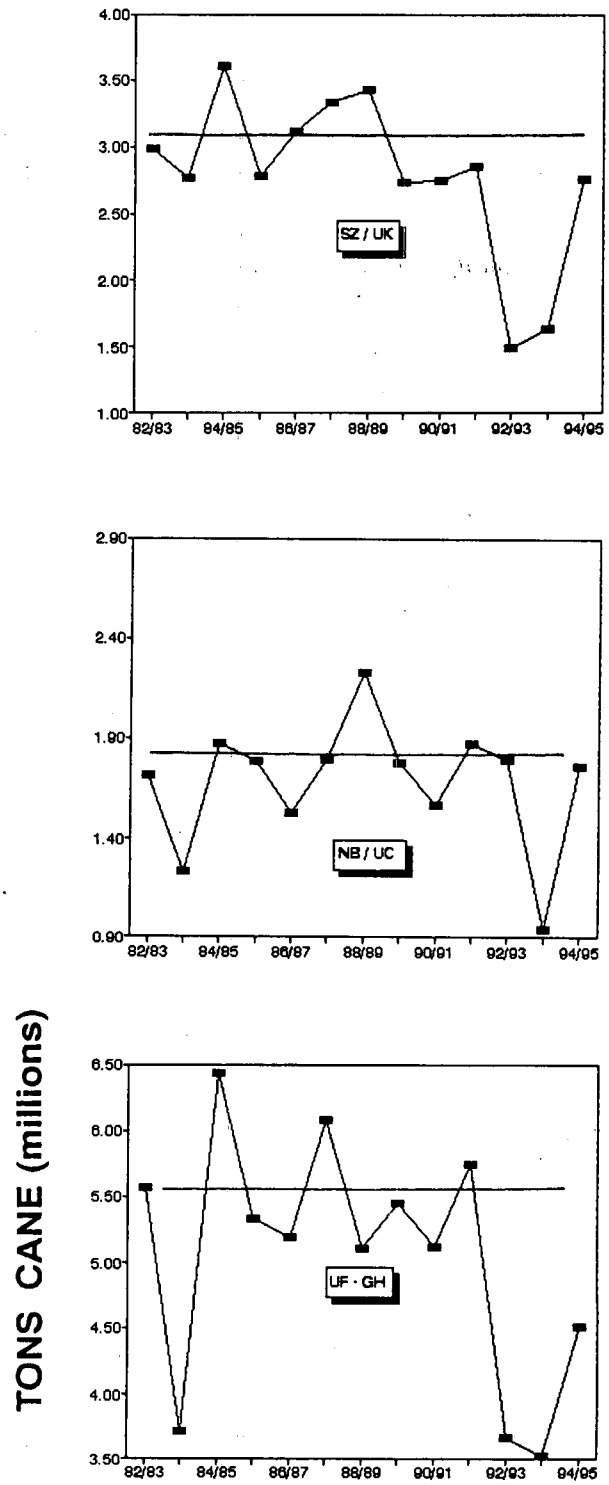
	Tons cane	Tons sugar
South Africa	15 683 290	1 674 547
Swaziland	3 797 935	485 292
Zimbabwe	4 244 253	523 152
Malawi	1 734 034	193 629
Zambia	1 307 233	145 340

Comparisons between recent seasons

One of the most marked effects of drought is the reduction in cane tonnage. The industry has been divided into arbitrary regions to investigate various effects of drought, as follows:

- SZ and UK in the south
- NB and UC to represent the midlands
- UF, AK, DL, GH and FX to represent the north coast
- ML and PG to represent the north.

The total tonnage of cane crushed in each region, for the past thirteen seasons, has been plotted in Figure 8, with the averages which exclude all the drought stricken seasons, also shown.



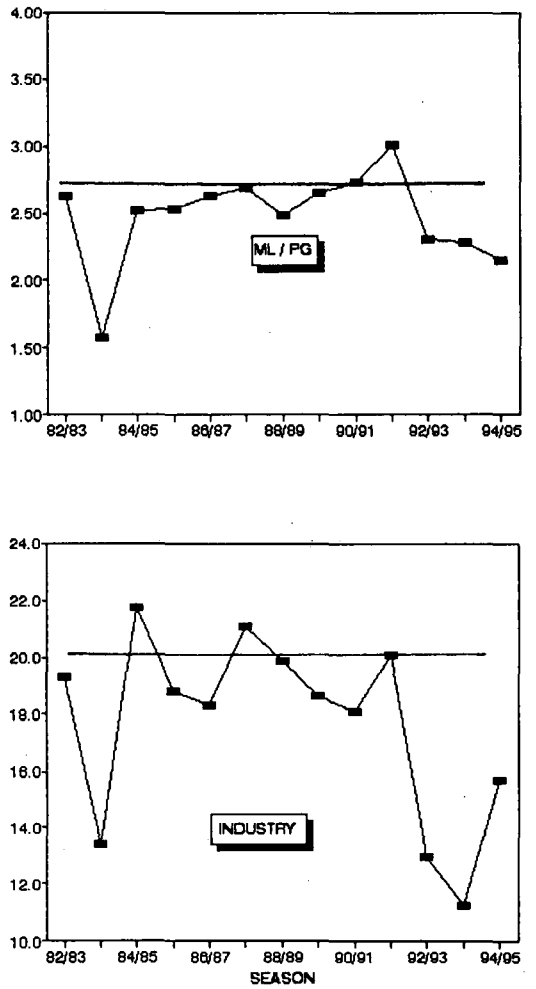


FIGURE 8 Tons cane crushed per season for each of the selected regions and for the industry. The average (excluding droughts) is shown.

The following comments may be made:

- There is a marked improvement at SZ/UK. This is due mostly to cane diversions (mostly from the closed down Illovo mill) and does not represent a gain in tonnage for the industry as a whole.
- The North Coast, although showing a recent improvement, is still well below average.
- Of the selected regions ML/PG is the only one showing a deterioration compared to the two previous drought stricken seasons. This is due mainly to the severe decrease at ML.

Length of season and time efficiency

The season in South Africa started on 6 April 1994 at PG and ended on 19 February 1995 at KM. Its overall length was 319 days, the longest and shortest periods being 305 days and 155 days at PG and ME, respectively.

The overall time efficiency (OTE) was low at 78,13 which is better than last season but still under the trend (about 81) before the droughts. Time accounts for 1993/94 and 1994/95 are compared in Table 8. This season's results are somewhat better than those of the preceding one. SZ (88,20) and GH (85,40) report the highest OTE values. DL reports the best (4,04) lost time % available.

This has been the last season for ME which has closed down permanently.

Table 8

Time accounts, 1993/94 and 1994/95

		1993/94	1994/95
Overall time efficiency		76,77	78,76
Scheduled stops	(%)	9,48	8,14
Lack of cane stops	(%)	6,66	6,28
Other stops	(%)	7,09	6,82
Lost time % available		8,46	7,97

Extraction

Sucrose extractions for the South African industry are shown in Figure 9. Except for the lower value of 97,75 in 1993/94, the drought has not affected extraction much and this season's value fits the longer term trend. The value for the 1991/92 season appears to be exceptional. KM (98,65) and DW (98,66; pol based) reported the highest extractions, at 394 and 297 imbibition % fibre, respectively. GH has paid attention to its extraction plants and recorded improvements as shown in Table 9. The improvements are not due to higher imbibition levels. Some of the reasons given are:

- Better pol/fibre ratios
- Mills set for actual fibre rates
- More consistent operations.

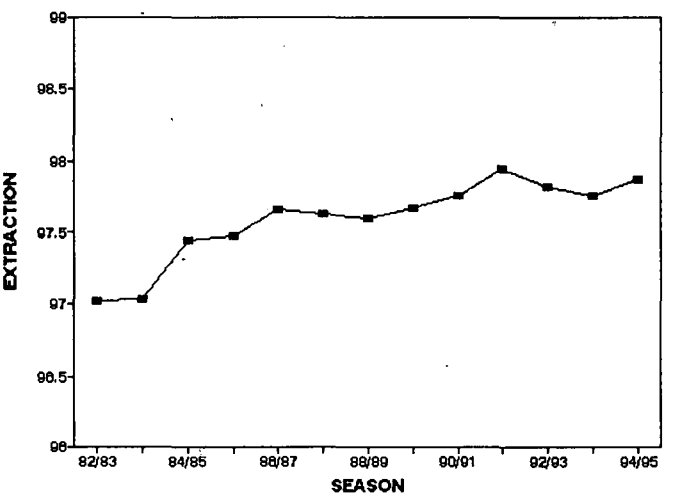


FIGURE 9 Sucrose extraction for the South African sugar industry.

Table 9

Extraction results at GH

	Diffuser		Mills	
	1993/94	1994/95	1993/94	1994/95
Extraction	97,65	97,97	97,74	98,49
Difference	+ 0,32		+ 0,35	
Imbibition % fibre	407	384	328	287

Bagasse moistures showed a wide range from 45,85 at DW to 54,95 for the diffuser at MS. The season's average was 51,27 and DW report the lowest value of 45,85%.

A disturbing observation concerning the last few seasons has been the decrease in the purity difference between mixed juices (MJ) and direct analysis of cane extracts (DAC), i.e. (MJ-DAC), as shown in Figure 10. Reasons for the fairly sudden decrease need to be investigated. These could include:

- Modifications to DAC sampling frequencies, although these were started more than three seasons ago.
- The use of aluminium chloride plus calcium hydroxide (Alca), as a substitute for lead acetate although this had been tested before industrial use and would in any case apply to the last two seasons only.
- Possible preferential extraction of brix by diffusers.
- Drought effects.
- Possible analytical effects, mostly brix, through the introduction of different refractometers.
- Extraction effects, since it is generally believed that as extraction rises the (MJ-DAC) purity difference drops. (MJ-DAC) purity differences for the 1994/95 season have been plotted against extraction in Figure 11. The dotted line represents the approximate trend that would be expected, except that AK and KM are slightly negative. UF, UC, PG, NB, ML and FX show a different trend, mostly in the negative regions of the graph.

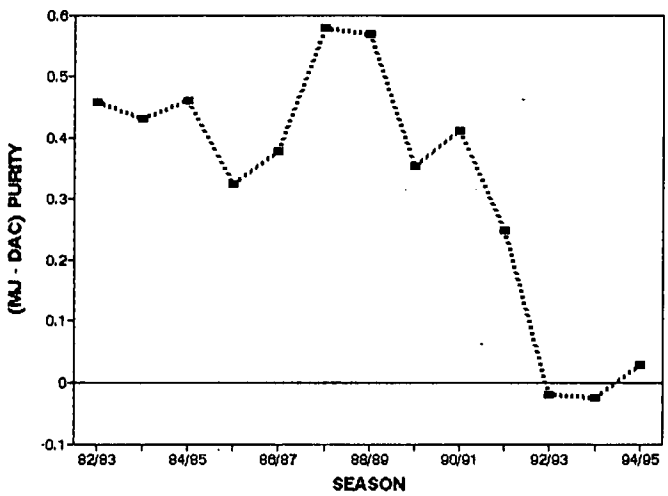


FIGURE 10 (MJ-DAC) purity difference for the South African sugar industry.

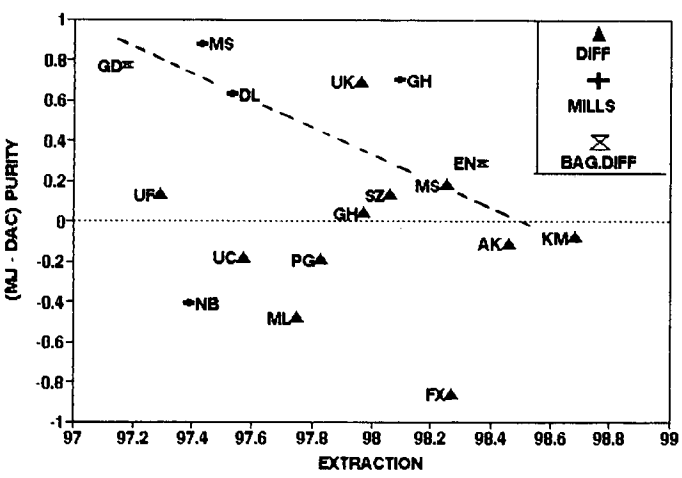


FIGURE 11 (MJ-DAC) purity difference plotted versus extraction for the 1994/95 season.

Mill sanitation is an aspect that could have an impact on (MJ-DAC) purities. Many sugar technology text books recommend frequent (even once every three hours) cleaning of milling equipment with high pressure, hot (75-90°C) water, using heavy duty hoses. In addition bactericides are mentioned. The activities of Leuconostoc species are curtailed when temperatures reach 45°C but much higher temperatures are necessary to kill these bacteria. The following mill sanitation procedure is being applied at one South African milling factory:

- The mills are hosed with 90°C water once a week, at shut down.
- Water at 90°C is used daily to wash in between the mills, the floors, etc.
- DSM screens are hosed with 90°C water once a shift. The screens are washed with a caustic solution once a week.
- Mixed juice is analysed regularly for lactic acid. If the concentration is greater than about 400 ppm on brix, a special sanitation programme involving hot water wash and chemical disinfection is undertaken.

Juice screening

NB and KM have installed rotary juice screens. Both screens have operated throughout the season and preliminary tests have been done at NB to measure the performance of the apparatus. Separation efficiencies appear to be rather low and it was felt that optimisation work is necessary.

Clarification and filtration

NB, UC, AK, UK, SZ and GH added phosphoric acid to mixed juice during the season. Clear juice quality was not always good there being turbid and dark coloured juices at a number of factories.

GH has been using saccharate liming for a number of seasons. Trials have been done to compare milk of lime to saccharate and the results have indicated that, although the use of milk of lime reduced the volume of muds, clear juice clarity was unacceptable. Saccharate has had to be used, particularly with rainy weather. GH staff has observed that the high turbidities in clear juice appear to persist throughout the raw factory and up to refined sugar. The problem is one of turbidity at the clarification station and not one of carry over. In conjunction with the milk of lime/saccharate tests, GH has investigated the use of flocculants and as a result of this work, has modified dosage rates and addition points. Finally, pH control and equipment have also been upgraded.

A light mixed juice sulphitation has been tested at NB. About 100 ppm of sulphur dioxide (on brix) has been added to pre-limed (pH 6,8) mixed juice, at 70°C. The juice is then heated and limed to its final pH. Lower viscosity and "cleaner" B- and C-massecuites appear to be benefits.

SZ has resized and redesigned its juice distribution piping from the flash tank to the clarifiers. With reduced throughputs and high sand/soil contents, limed juice velocity becomes important with respect to solids settling in the pipes, as this can cause serious problems and even danger to personnel. FX physically reduced the mud boot volumes in the clarifiers.

NB designed and commissioned a new bagacillo separation and addition system, which has led to substantial improvements for the filter station. At the same time transducers, developed by the SMRI, were installed. These developments are described in detail in a paper by Sanders (1995).

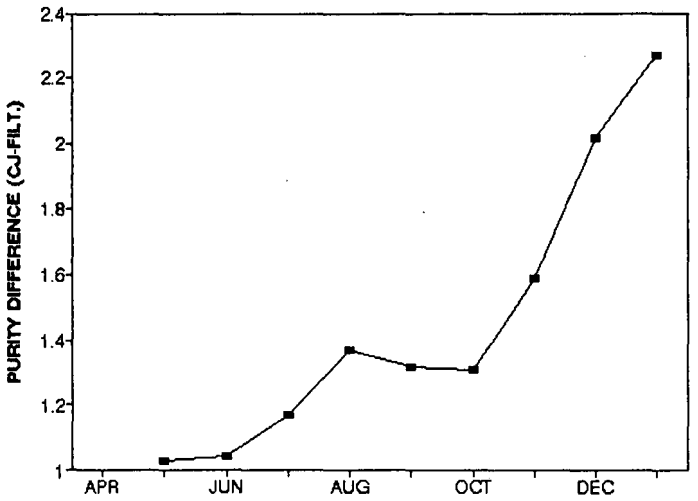


FIGURE 12 Monthly values of the difference between clear juice and filtrate purities.

A number of factories reported some concern about low filtrate purities. The purity difference (clear juice-filtrate) for the industry is plotted in Figure 12.

Two comments may be made:

- The absolute value of the difference is unacceptably high for most of the season. Previous industrial results (Lionnet, 1991) show that three factories achieved a difference of under one unit for a complete season.
- The deterioration in the result increases markedly as the season progresses. This could indicate large increases in the number of micro-organisms in the filter station due to poor sanitation.

It should also be noted that if the purity drop is due to microbiological activity, the deterioration by-products have negative effects on molasses exhaustion. Previous investigations have shown that it is possible to reduce microbiological activity in the filter station by the use of heat and of bactericides.

Evaporation

A falling film evaporator has been operational at PG this season, as a first effect. Generally, this evaporator performed well and was relatively easy to control. Chemical cleaning was used with reasonable success.

Scale has been a problem at a number of factories. At NB scales containing high levels of aconitates were difficult to clean. A major project at the SMRI involves the study of scales, with respect to both the chemistry of its formation and cleaning procedures. Preliminary results are given by Walthew and Turner (1995).

Finally, a pilot plant long tube climbing film evaporator has been designed and commissioned at FX for the investigation of factors which could affect the heat transfer (Walthew *et al.* 1995).

Boiling house

Boiling house recovery (BHR) at 86,50 was the highest for the three drought stricken seasons but still well below the normal level of about 88,5 achieved prior to the droughts. The same comments apply to the loss in molasses, which is high at 10,97 when compared with the pre-drought levels of about 9,0. Undetermined loss at 2,01 is nearly normal, as is the loss in filter cake (0,22). These trends are shown in Figure 13, and indicate that the poor BHR is due mostly to the loss in molasses. It is, therefore, interesting to investigate possible causes for the high sucrose loss in final molasses. Target purity difference (TPD), molasses true purity, the molasses factor, molasses % cane and the sucrose lost in molasses for the last eleven seasons are shown in Figure 14.

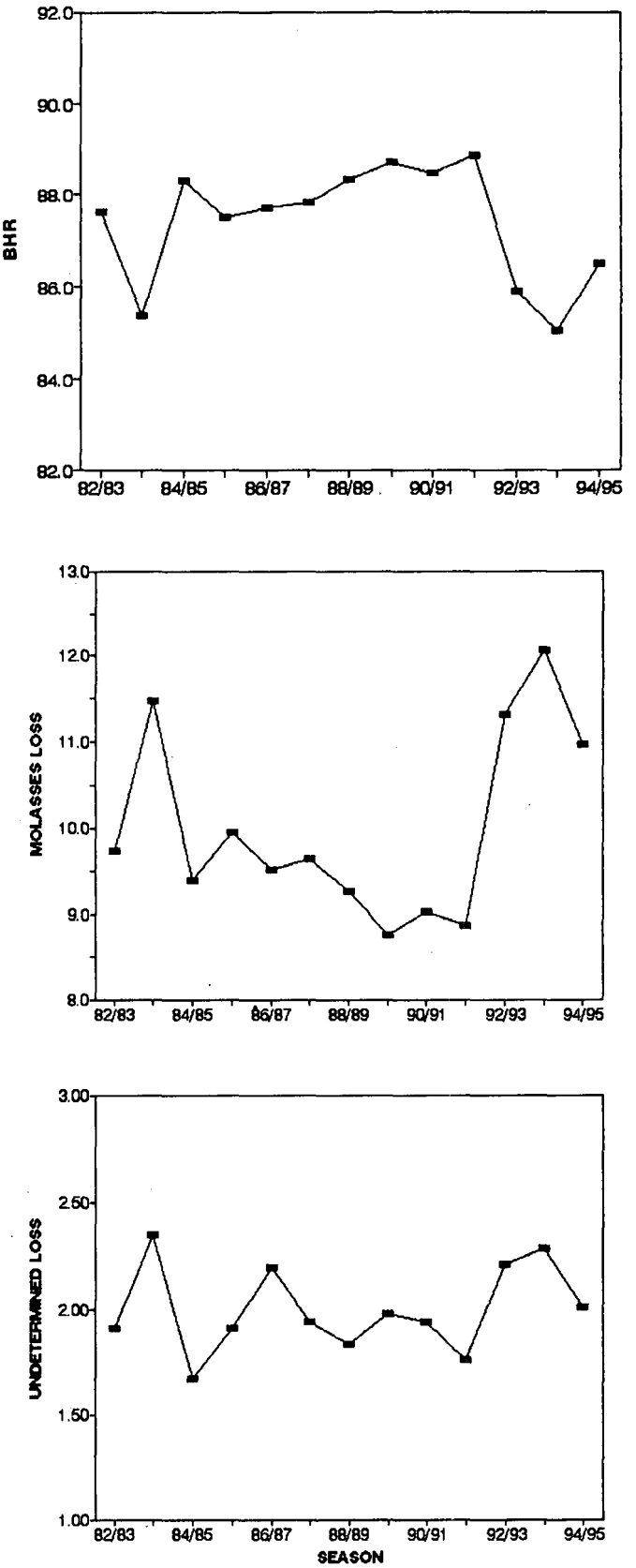
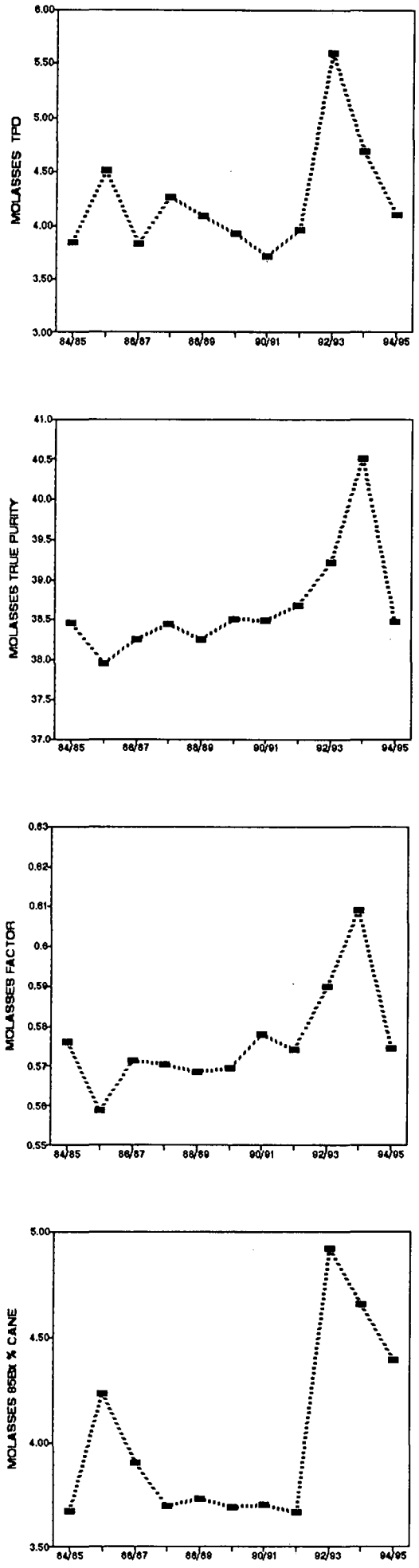


FIGURE 13 BHR and sucrose lost in molasses and in undetermined for the South African sugar industry over the last eleven seasons.



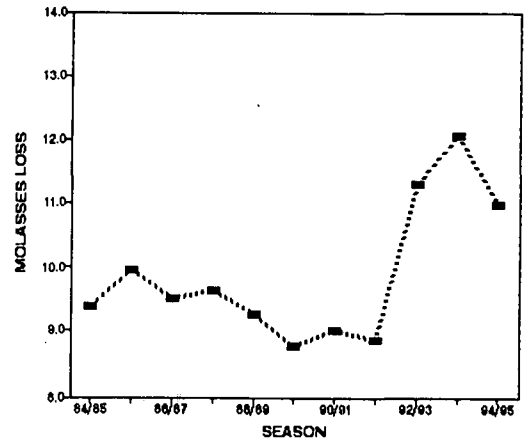


FIGURE 14 TPD, molasses purity, molasses factor, molasses at 85 brix % cane and the sucrose lost in molasses for South African sugar industry over the last eleven seasons.

It is evident from this figure that TPD, molasses purity and the molasses factor are all back to more or less normal values this season. The quantity of molasses, however, expressed as tons of molasses at 85 brix % cane, is still high at 4,39% against a pre-drought average of about 3,7%. This indicates that molasses exhaustion was reasonably normal but that the quantity of molasses was abnormally high. The quantity of molasses is a function of the quantity of impurity in the mixed juice. Loss of sucrose in molasses and mixed juice impurity (100-purity) are plotted in Figure 15.

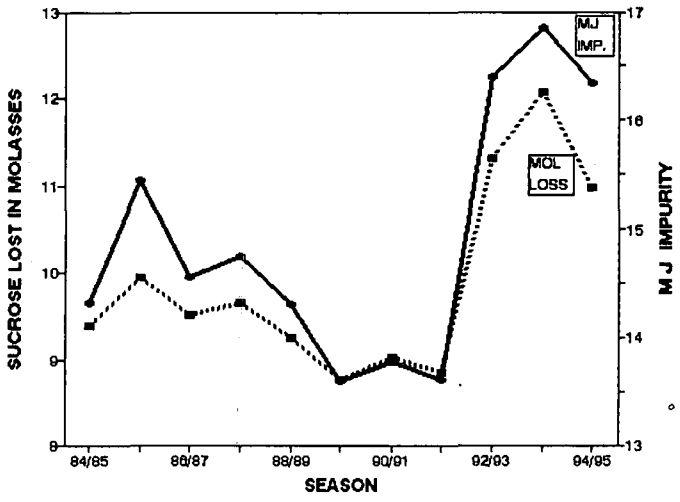


FIGURE 15 Sucrose lost in molasses and mixed juice impurity for the South African sugar industry over the last eleven seasons.

The overriding influence of the quantity of impurity in mixed juice, and therefore in the cane itself, is clearly evident. The fact that the molasses factor and the TPD are nearly back to normal levels shows that the quality of the impurities was not different from that prior to the two previous drought stricken seasons.

Corrected boiling house recovery (CRB) has increased to 86,58 as expected from the improvements discussed above, but is still below the pre-drought level of about 86,8.

As far as individual factory performances are concerned, UC (90,23) and NB (88,97) had the best BHR values. At UC the losses in molasses and in undetermined were low

(8,01 and 1,40, respectively). At NB the loss in molasses was low (8,67) but the undetermined (1,77) was just better than the industrial average.

DL's undetermined loss was the lowest (1,20) in the industry, being the lowest value since 1992/93. This was achieved in spite of many stop/start occurrences due to the erratic cane supply at DL, but the process staff reported the use of much biocide.

The best CRB (87,87) was achieved by UF.

Final molasses viscosity and C-massecuite crystal size distributions have now been measured for a number of seasons by the Sugar Milling Research Institute. The results for the Illovo Sugar Limited factories are reviewed by Jullienne (1995). This review shows that there are important differences in molasses viscosity and C-crystal shapes and both factors could have marked effects on molasses exhaustion.

Sugar quality

The average analysis of the total very high pol (VHP) produced in South Africa was 99,36% pol, 0,11% moisture and 1661 ICUMSA colour units. Some quality parameters of raw sugar sent to the SA Sugar Terminals and to Hulett Refineries are shown in Table 10.

Table 10

Average analysis of sugar supplied to the SA Sugar Terminals and to Hulett Refineries

	Terminal	Hulett Refinery
Pol (%)	99,32	99,36
Moisture (%)	0,13	0,13
Colour (ICUMSA)	1749	1575
Colour of affinated crystal	864	–
Starch (ppm)	126	107
Ash (%)	0,14	0,16

Generally, sugar quality has improved with respect to the 1993/94 season, but colour is still high. Comments obtained from individual factories indicate that VHP colour has generally been a problem, except at KM. NB, AK and MS reported high VHP colours. Smith (1990) and Lionnet (1991) show that VHP colour is usually a function of syrup colour and calculate that under South African conditions VHP colour is between 4,8% and 6,7% of syrup colour. Data collected from NB for the 1994/95 season show that VHP colour at NB is 7,7% of syrup colour. This indicates an unusually high colour transfer for this season.

Affinated crystal colour is independent of the washing process during centrifugation and is thus a better indicator of colour in sugar. This analysis is, however, available only for sugars delivered to the Terminal. Results for the last eleven seasons are in Figure 16 and show the high levels associated with droughts in the last three seasons.

Refined sugar colour for the South African industry is shown in Figure 17. There has been a remarkable improvement this season with a level of colour last seen in the late nineteen-eighties. The improvement has been particularly noticeable at Hulett Refineries and NB with 35 and 38 ICUMSA colour units respectively. This has been achieved with VHP of higher colour and reflects the success of the various chemical decolourisation processes used to augment the efficiency of the more traditional methods, and of the attention to quality control.

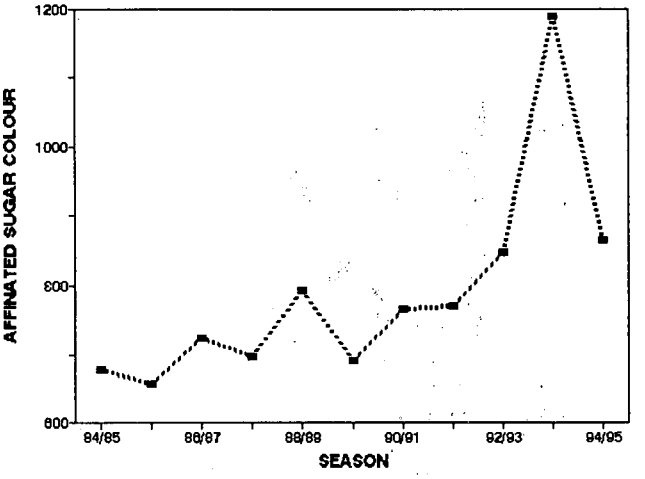


FIGURE 16 Affinated crystal colour for South African VHP.

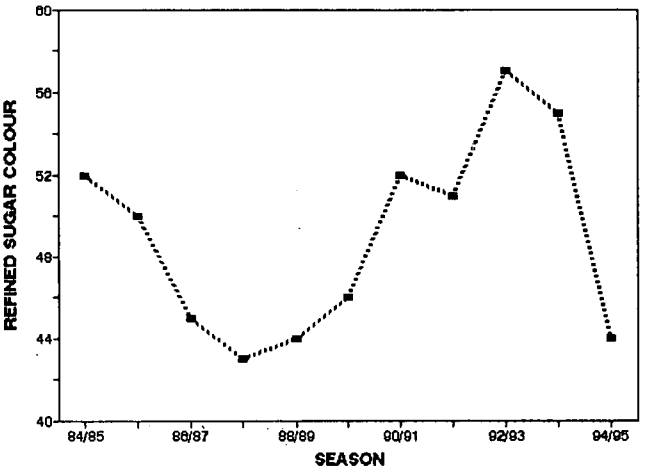


FIGURE 17 Refined sugar colour for the South African sugar industry.

Facilities to affinate B-sugar have been available at NB since 1993, and were fully operational this season. The results were encouraging and confirmed that this is a practical and cost effective process for a raw house with a back-end refinery.

Acknowledgements

The assistance of Messrs M Vanis, M Achary and S Padayachee in the analysis of the data, the preparation of the tables and the drawing of the graphs is gratefully acknowledged. Thanks are due to the SA Sugar Association Cane Testing Service, the SA Sugar Terminals and all the factories in South Africa, Malawi, Swaziland, Zimbabwe and Zambia, for the data supplied. The author would also like to thank Mrs A Dunsmore of the SMRI for her help.

REFERENCES

Du Plooy, DE (1994). Rock and sand removal at TSB's Komati Mill. *Proc S Afr Sug Technol Ass* 69: 153-155.

Jullienne, LMSA (1995). Molasses viscosity and crystal shape at Illovo Sugar Limited. *Proc S Afr Sug Technol Ass* 70: in the press.

Lionnet, GRE (1991). Sixty-sixth annual review of the milling season in Southern Africa (1990-1991). *Proc S Afr Sug Technol Ass* 65: 1-18.

Sanders, R (1995). Improvements to the Noodsberg Oliver filter station. *Proc S Afr Sug Technol Ass* 70: in the press.

Smith, IA (1990). A survey of colour input and formation in process. *Proc S Afr Sug Technol Ass* 64: 213-216.

Walthew, DC and Turner, LM (1995). Analysis of scale from some South African sugar mills. *Proc S Afr Sug Technol Ass 70*: in the press.

Walthew, DC, Whitelaw, RW and Peacock, SD (1995). Preliminary results from a long tube climbing film pilot evaporator. *Proc S Afr Sug Technol Ass* 70: in the press.

TABLE B1

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

SYMBOLS OF FACTORIES	ML *	KM	PG *	UF *	EN **	FX-A *	FX-B *	FX-AVE	AK *	DL	MS-A *
TONS SUGAR MADE AND ESTIMATED	116644	44314	132785	109428	32041	-	-	165075	135264	108404	-
REFINED % TOTAL SUGAR	-	-	100.00	81.97	-	-	-	-	-	-	-
MOISTURE ALL SUGAR	0.10	0.09	0.03	0.04	0.13	-	-	0.11	0.15	0.15	-
POL ALL SUGAR	99.34	99.45	99.73	99.87	99.27	-	-	99.41	99.23	99.32	-
TONS CANE CRUSHED TOTAL	990304	441375	1173815	1000150	274812			1619122	1271847	1091691	
TONS CANE CRUSHED PER TANDEM						856580	762542				805241
SEASON STARTED ON	16/05/94	26/07/94	06/04/94	05/05/94	05/05/94	-	-	17/05/94	18/05/94	16/05/94	-
SEASON COMPLETED ON	24/11/94	19/02/95	05/02/95	11/12/94	28/11/94	-	-	17/12/94	27/11/94	07/12/94	-
NUMBER OF CRUSHING DAYS	192	208	305	220	207	-	-	214	193	205	-
TIME ACCOUNT											
OVERAL TIME EFFICIENCY %	77.55	70.14	79.99	78.39	74.31	76.08	71.99	74.09	79.81	74.77	84.93
SCHED.STOPS% GROSS AVAIL.TIME	9.28	9.48	5.76	5.20	11.66	10.36	10.37	10.36	8.74	8.46	4.26
LACK OF CANE % GROSS	5.71	8.00	3.20	4.76	7.40	8.81	13.78	11.23	6.09	13.63	3.15
OTHER STOPS % GROSS	7.46	12.39	11.04	11.65	6.63	4.76	3.85	4.32	5.36	3.15	7.66
LOST TIME % AVAIL.CRUSH.TIME	8.78	15.01	12.13	12.94	8.19	5.89	5.08	5.51	6.29	4.04	8.27
THROUGHPUTS PER CRUSHING HOUR											
TONS CANE	278.58	147.48	202.04	248.47	74.28	221.51	220.03	441.54	343.44	282.69	181.54
TONS FIBRE	39.09	21.25	29.23	34.87	10.18	35.83	36.31	72.14	52.58	42.67	28.12
TONS BRIX IN MIXED JUICE	44.10	22.73	31.14	36.57	11.35	31.88	31.84	63.72	50.71	39.20	25.51
TONS SUCROSE IN MIXED JUICE	36.83	18.20	26.38	31.16	9.75	26.37	26.30	52.67	42.08	32.23	21.01
TONS NON-SUC. IN MIXED JUICE	7.27	4.53	4.76	5.41	1.60	5.51	5.54	11.05	8.63	6.97	4.49
TONS OF SUGAR PRODUCED	32.81	14.81	22.86	27.19	8.66	-	-	22.51	36.53	28.07	-
COMPOSITION OF CANE CRUSHED											
SUCROSE % CANE	13.52	12.51	13.35	12.89	13.34	12.12	12.15	12.14	12.44	11.69	11.78
POL % CANE	13.29	12.24	13.18	12.71	13.10	11.95	12.03	11.99	12.25	11.46	11.56
FIBRE % CANE	14.13	14.45	14.54	14.62	14.70	16.28	16.61	16.43	15.51	16.10	15.72
BRIX % CANE	16.39	15.79	15.93	15.40	15.72	14.92	14.99	14.95	15.26	14.53	14.51
ASH % CANE	1.64	-	1.35	2.03	1.07	1.85	1.99	1.92	1.31	1.35	1.48
ERC % CANE	11.44	10.21	11.41	11.00	11.51	10.06	10.07	10.06	10.38	9.62	9.78
ERC % SUCROSE IN CANE	84.56	81.66	85.47	85.33	86.26	82.99	82.85	82.92	83.41	82.31	82.99
EXTRACTION											
EXTRACTION (SUCROSE BASED)	97.75	98.65	97.79	97.29	98.37	98.22	98.32	98.27	98.46	97.53	98.25
CORRECTED REDUCED EXTRACTION	97.41	98.57	97.57	97.00	98.11	98.38	98.51	98.44	98.48	97.63	98.35
IMBIBITION % CANE	61.71	56.71	45.25	54.30	64.15	53.62	63.07	58.07	62.02	57.68	59.63
IMBIBITION % FIBRE	440	394	313	387	468	331	382	356	405	382	385
PREPARATION INDEX	92	93	90	90	89	92	92	92	92	91	92
POL FACTOR	98.24	98.82	99.32	99.71	99.62	98.38	99.67	98.99	99.06	100.00	99.47
BRIX FACTOR	99.97	99.91	100.62	101.27	100.48	101.32	102.43	101.84	100.92	101.32	100.63
RECOVERIES											
BOILING HOUSE RECOVERY (SUC.)	88.51	80.93	86.40	87.12	88.18	-	-	84.97	86.13	86.49	-
C. R. B.	87.73	83.40	85.52	87.87	85.47	-	-	86.48	87.10	87.30	-
OVERALL RECOVERY (SUCROSE)	86.52	79.84	84.49	84.76	86.74	-	-	83.50	84.81	84.36	-
TON CANE PER TON SUGAR	8.49	9.96	8.84	9.14	8.58	-	-	9.81	9.40	10.07	-
TON CANE PER TON 96 SUGAR	8.15	9.56	8.49	8.77	8.23	-	-	9.42	9.03	9.67	-
BALANCES											
SUC. LOST % SUC.IN CANE											
- LOST IN BAGASSE (A)	2.25	1.35	2.21	2.71	1.63	-	-	1.73	1.54	2.47	-
- LOST IN FILTER CAKE (B)	0.14	0.25	0.28	0.48	0.13	-	-	0.15	0.07	0.41	-
- LOST IN FINAL MOLASSES (C)	9.75	14.35	10.69	10.45	9.60	-	-	12.24	11.30	11.56	-
- UNDETERMINED LOSSES (D)	1.34	4.22	2.33	1.60	1.90	-	-	2.37	2.29	1.20	-
BOILING HOUSE LOSSES(B+C+D)	11.23	18.82	13.29	12.53	11.63	-	-	14.77	13.66	13.17	-
SUM OF ALL LOSSES(A+B+C+D)	13.48	20.16	15.51	15.24	13.26	-	-	16.50	15.19	15.64	-
NON SUCROSE RATIO	1.03	1.04	1.01	0.99	1.02	-	-	1.00	0.95	0.99	-
FRUCTOSE RATIO FM/MJ	0.98	0.93	0.92	0.83	0.84	-	-	0.96	0.87	0.81	-
GLUCOSE RATIO FM/MJ	0.80	0.63	0.69	0.52	0.69	-	-	0.65	0.52	0.60	-

* CANE DIFFUSER ** BAGASSE DIFFUSER

THROUGHPUTS AND TIME ACCOUNTS, PERFORMANCES AND LOSSES (SEASON 1994 - 1995)

MS-B	MS-AVE	ME	GD **	GH-A *	GH-B	GH-AVE	NB	UC *	SZ-A *	SZ-B *	SZ-AVE	UK *	INDUSTRY
-	138032	50908	28245	-	-	112150	131773	80048	-	-	202840	85713	1673664
-	-	-	-	-	-	83.05	100.00	-	-	-	-	-	26.73
-	0.06	0.06	0.11	-	-	0.03	0.02	0.07	-	-	0.12	0.12	0.09
-	99.38	99.56	99.42	-	-	99.84	99.93	99.53	-	-	99.34	99.22	99.50
581562	1386803	483253	288210	329291	816748	1146039	1108230	651769	937911	960965	1898876	856994	15683290
-	17/05/94	16/05/94	24/05/94	-	-	18/05/94	05/05/94	20/04/94	-	-	05/05/94	17/05/94	06/04/94
-	21/12/94	18/10/94	04/12/94	-	-	15/12/94	29/11/94	18/12/94	-	-	20/12/94	11/12/94	19/02/95
-	218	155	194	-	-	211	208	242	-	-	229	208	319
66.60	75.94	65.12	74.69	83.14	87.63	85.40	80.18	83.02	86.89	89.50	88.20	81.56	78.13
4.49	4.37	20.69	6.47	6.07	4.82	5.44	6.49	7.25	4.57	4.54	4.55	11.11	8.14
18.58	10.72	7.92	8.66	6.68	4.34	5.50	3.04	2.55	3.67	0.54	2.10	2.83	6.28
10.32	8.97	6.27	10.18	4.11	3.21	3.66	10.29	7.18	4.88	5.42	5.15	4.50	7.45
13.42	10.56	8.78	12.00	4.71	3.53	4.11	11.37	7.96	5.32	5.71	5.52	5.22	8.71
173.73	355.27	199.64	82.68	81.64	190.29	271.94	275.95	134.90	198.10	195.75	393.86	210.65	248.90
26.06	54.18	28.64	12.16	13.51	29.08	42.59	37.92	18.40	32.07	31.30	63.36	34.10	37.49
23.83	49.34	29.15	11.69	11.43	26.39	37.82	42.33	20.97	29.22	28.89	58.11	29.09	36.52
19.85	40.87	24.35	9.66	9.33	21.91	31.24	36.85	18.28	24.41	23.95	48.36	24.12	30.55
3.98	8.47	4.81	2.02	2.10	4.49	6.58	5.48	2.69	4.81	4.94	9.76	4.97	5.97
-	17.73	21.03	8.10	-	-	13.47	32.81	16.57	-	-	21.03	21.07	21.04
11.73	11.76	12.57	12.03	11.67	11.74	11.72	13.71	13.88	12.56	12.48	12.52	11.69	12.54
11.46	11.52	12.31	11.81	11.48	11.52	11.51	13.46	13.70	12.36	12.30	12.33	11.49	12.34
15.77	15.74	15.13	14.93	16.70	16.02	16.21	15.14	13.86	16.36	16.17	16.26	16.50	15.49
14.34	14.44	15.36	14.80	14.49	14.33	14.38	15.96	16.11	15.30	15.31	15.30	14.32	15.23
1.35	1.43	-	-	3.13	3.75	3.57	1.46	1.38	-	-	-	1.72	1.74
9.78	9.78	10.52	10.01	9.60	9.80	9.74	11.93	12.14	10.52	10.39	10.46	9.72	10.55
83.42	83.17	83.72	83.20	82.27	83.48	83.14	87.01	87.40	83.77	83.31	83.54	83.18	84.10
97.43	97.91	97.04	97.18	97.97	98.09	98.05	97.39	97.57	98.07	98.05	98.06	97.96	97.87
97.51	98.01	96.86	97.14	98.24	98.19	98.20	96.94	97.07	98.21	98.17	98.19	98.19	97.85
52.80	56.77	40.91	43.22	63.47	43.92	49.54	38.79	45.31	59.94	61.54	60.75	71.82	55.10
352	371	285	294	384	287	317	282	332	370	385	378	444	366
91	91	90	89	90	90	90	90	93	-	-	-	91	91
99.23	99.37	98.61	99.67	99.73	99.18	99.34	99.61	99.86	99.48	99.61	99.55	99.83	99.34
99.96	100.35	99.92	100.38	101.01	99.62	100.02	101.38	101.16	100.80	101.27	101.04	100.52	100.82
-	85.92	86.01	83.36	-	-	85.04	88.97	90.23	-	-	86.43	86.68	86.50
-	86.49	85.62	84.07	-	-	86.40	86.25	86.79	-	-	86.67	87.46	86.59
-	84.12	83.47	81.01	-	-	83.39	86.64	88.04	-	-	84.76	84.91	84.66
-	10.05	9.49	10.20	-	-	10.22	8.41	8.14	-	-	9.36	10.00	9.37
-	9.65	9.11	9.80	-	-	9.81	8.07	7.82	-	-	8.99	9.60	9.00
-	2.09	2.96	2.82	-	-	1.95	2.61	2.43	-	-	1.94	2.04	2.13
-	0.31	0.45	0.22	-	-	0.28	0.31	0.12	-	-	0.06	0.07	0.22
-	11.23	11.31	13.03	-	-	11.70	8.67	8.01	-	-	11.34	11.57	10.97
-	2.25	1.81	2.92	-	-	2.69	1.77	1.40	-	-	1.90	1.41	2.01
-	13.79	13.58	16.17	-	-	14.67	10.74	9.53	-	-	13.30	13.05	13.21
-	15.88	16.53	18.99	-	-	16.61	13.36	11.96	-	-	15.24	15.09	15.34
-	1.03	0.96	0.98	-	-	1.03	1.03	0.98	-	-	0.99	0.98	1.00
-	0.90	0.87	0.90	-	-	0.91	0.88	0.86	-	-	0.94	0.87	0.90
-	0.67	0.66	0.60	-	-	0.65	0.67	0.46	-	-	0.63	0.57	0.64

TABLE C1

ANALYSIS OF BAGASSE, JUICES, FILTER
SOUTH AFRICAN MILLS

SYMBOLS OF FACTORIES	ML *	KM	PG *	UF *	EN **	FX-A *	FX-B *	FX-AVE	AK *	DL	MS-A *
FINAL BAGASSE											
POL % BAGASSE	0.95	0.61	1.00	1.15	0.78	0.62	0.57	0.60	0.60	0.87	0.58
MOISTURE % BAGASSE	54.30	46.63	49.22	51.45	49.49	52.31	52.41	52.36	50.07	52.83	54.95
FIBRE % BAGASSE	43.95	52.01	49.02	46.31	48.91	46.17	46.15	46.16	48.37	45.19	43.77
BAGASSE % CANE	31.93	27.70	29.51	30.30	28.01	35.03	35.76	35.37	31.65	33.40	35.39
ASH % BAGASSE	3.51	5.02	-	4.16	-	-	-	4.35	3.90	2.61	-
LCV IN KJ PER KG BAGASSE ##	6293	7601	-	6742	-	-	-	6541	7101	6768	-
MIXED JUICE											
MIXED JUICE % CANE	129.78	129.01	115.74	124.00	136.15	118.58	127.31	122.69	130.36	124.28	124.24
BRIX % MIXED JUICE	12.20	11.94	13.32	11.87	11.22	12.14	11.37	11.76	11.33	11.16	11.31
SUCROSE PURITY	83.51	80.06	84.72	85.21	85.94	82.72	82.58	82.66	82.98	82.22	82.38
APPARENT PURITY	82.06	78.35	83.57	84.01	84.37	81.53	81.74	81.63	81.67	80.53	80.83
PURITY DIFFERENCE(MJ - DAC)	-0.48	-0.06	-0.21	0.13	0.29	-0.93	-0.79	-0.86	-0.11	0.63	0.18
(GLUC. + FRUCT.)/SUC. RATIO	7.77	10.51	6.63	4.11	5.47	-	-	5.73	5.41	7.31	-
SUSPENDED SOLIDS % MIXED JUICE	0.07	0.04	0.06	0.47	0.73	0.08	0.08	0.08	0.15	0.81	0.19
POL/SUCROSE RATIO	0.9826	0.9785	0.9864	0.9859	0.9817	0.9856	0.9897	0.9875	0.9842	0.9794	0.9811
CLARIFIED JUICE											
BRIX % CLARIFIED JUICE	11.92	11.74	12.97	11.77	11.06	-	-	11.18	10.99	10.61	-
APPARENT PURITY	82.09	78.68	83.88	83.94	84.14	-	-	81.34	81.91	80.69	-
PURITY DIFFERENCE(CJ - MJ)	0.03	0.33	0.31	-0.07	-0.23	-	-	-0.29	0.24	0.16	-
AVERAGE PH	7.1	7.0	6.9	6.6	7.1	-	-	7.1	7.1	7.1	-
FILTER CAKE											
POL % FILTER CAKE	0.48	2.28	0.96	1.29	0.64	-	-	0.73	1.00	0.94	-
MOISTURE % FILTER CAKE	74.13	57.97	73.81	68.43	74.37	-	-	73.97	77.43	73.44	-
FILTER CAKE % CANE	4.00	1.38	3.93	4.79	2.68	-	-	2.50	0.83	5.04	-
FILTER WASH INDEX	102.3	101.7	102.7	100.8	101.4	-	-	105.2	103.1	105.2	-
PURITY DIFF.(CJ - FILTRATE)	1.80	6.59	2.74	2.27	0.32	-	-	1.07	1.90	1.20	-
SYRUP											
BRIX % SYRUP	67.54	66.53	59.08	62.93	64.02	-	-	64.04	66.21	62.64	-
APPARENT PURITY	82.02	77.95	83.34	84.18	84.33	-	-	81.90	82.27	81.41	-
PURITY DIFFERENCE(SYRUP - MJ)	-0.04	-0.40	-0.23	0.17	-0.04	-	-	0.27	0.60	0.88	-
AVERAGE PH	6.0	6.6	6.1	6.3	6.2	-	-	5.9	6.1	6.2	-
FINAL MOLASSES											
REFRACTO BRIX	83.31	83.29	80.64	83.94	83.56	-	-	81.72	82.61	85.71	-
POL/REFRACTO BRIX PURITY	29.59	31.05	33.46	36.42	34.03	-	-	34.27	34.08	32.31	-
SUC/REFRACTO BRIX PURITY	33.52	36.33	37.66	38.47	37.65	-	-	37.68	37.75	36.23	-
SULPHATED ASH %	13.12	13.70	12.88	17.57	13.34	-	-	14.66	14.90	14.55	-
(GLUC. + FRUCT.)/ASH RATIO	1.47	1.23	1.15	0.48	1.02	-	-	0.78	0.69	0.93	-
FRUCTOSE %	10.10	9.42	8.31	5.22	7.83	-	-	6.85	6.64	8.07	-
GLUCOSE %	9.22	7.39	6.45	3.13	5.75	-	-	4.55	3.69	5.52	-
TPD BASED ON MOLASSES	4.1	5.8	6.2	2.6	6.2	-	-	3.7	3.3	4.0	-
TPD BASED ON MIXED JUICE	4.7	7.6	7.8	5.1	8.3	-	-	5.0	5.7	6.5	-
FINAL MOL AT 85 BRIX % CANE	4.63	5.81	4.46	4.12	4.00	-	-	4.64	4.38	4.39	-
POL/SUCROSE RATIO	0.8827	0.8547	0.8884	0.9467	0.9038	-	-	0.9095	0.9028	0.8918	-

* CANE DIFFUSER
** BAGASSE DIFFUSER
LCV = 18309 - 31,14 Bx % BAGASSE - 207,63 MOISTURE % BAGASSE - 196,05 ASH % BAGASSE

CAKE, SYRUP AND FINAL MOLASSES
(SEASON 1994 - 1995)

MS-B	MS-AVE	ME	GD **	GH-A *	GH-B	GH-AVE	NB	UC *	SZ-A *	SZ-B *	SZ-AVE	UK *	INDUSTRY
0.93	0.72	1.18	1.09	0.68	0.72	0.71	1.29	1.08	0.74	0.74	0.74	0.68	0.83
51.65	53.64	52.10	50.79	51.32	49.65	50.17	48.42	54.67	48.85	49.37	49.12	52.69	51.27
46.40	44.82	45.51	47.09	47.29	48.87	48.38	49.35	43.52	49.47	48.96	49.21	45.86	47.00
32.33	34.10	31.52	31.24	35.00	31.27	32.34	27.84	31.34	32.72	32.66	32.69	35.29	32.05
-	1.54	-	-	-	-	-	2.80	3.42	-	-	4.35	3.15	2.81
-	6824	-	-	-	-	-	7639	6232	-	-	7207	6708	6878
120.47	122.66	109.39	111.99	128.47	112.65	117.20	110.95	113.97	127.22	128.88	128.06	136.52	123.05
11.39	11.34	13.35	12.62	10.90	12.31	11.87	13.83	13.64	11.59	11.45	11.52	10.11	11.92
83.31	82.76	83.51	82.68	81.65	83.01	82.61	87.06	87.16	83.52	82.89	83.20	82.92	83.66
81.33	81.03	81.74	81.12	80.33	81.43	81.11	85.43	85.94	82.17	81.69	81.93	81.50	82.26
0.88	0.47	0.53	0.77	0.04	0.70	0.51	-0.41	-0.18	0.29	-0.02	0.13	0.69	0.03
-	6.72	6.68	7.13	-	-	6.81	4.78	4.41	-	-	5.87	5.86	6.14
0.64	0.37	0.72	0.20	0.11	0.65	0.48	1.26	0.19	0.14	0.14	0.14	0.23	0.34
0.9763	0.9791	0.9788	0.9812	0.9838	0.9810	0.9818	0.9813	0.9860	0.9838	0.9855	0.9847	0.9829	0.9832
-	10.81	13.10	11.75	-	-	11.36	12.93	13.83	-	-	11.09	9.75	11.55
-	80.46	83.00	81.71	-	-	81.25	85.63	85.65	-	-	82.20	81.21	82.27
-	-0.57	1.26	0.59	-	-	0.14	0.20	-0.29	-	-	0.27	-0.29	0.02
-	7.0	7.1	7.0	-	-	7.0	7.1	6.9	-	-	6.9	7.0	7.0
-	0.81	0.88	1.75	-	-	0.97	0.65	1.13	-	-	0.75	0.75	0.88
-	72.36	74.98	-	-	-	69.69	75.02	73.98	-	-	75.78	76.40	73.04
-	4.48	6.46	1.53	-	-	3.36	6.44	1.51	-	-	0.98	1.04	3.18
-	104.9	101.9	107.4	-	-	104.5	106.9	98.6	-	-	103.9	103.7	103.2
-	1.49	0.20	1.95	-	-	1.45	1.05	2.85	-	-	1.17	1.52	1.28
-	68.51	69.10	57.79	-	-	63.54	67.14	68.39	-	-	63.63	67.43	64.93
-	81.14	82.98	82.17	-	-	81.24	85.71	86.13	-	-	82.55	82.46	82.53
-	0.11	1.24	1.05	-	-	0.13	0.28	0.19	-	-	0.62	0.96	0.27
-	6.0	6.2	6.3	-	-	6.0	6.0	6.3	-	-	5.9	6.0	6.1
-	83.73	82.63	78.53	-	-	81.18	82.17	79.25	-	-	81.13	80.61	82.20
-	31.45	33.75	35.21	-	-	31.90	33.05	31.58	-	-	32.97	33.71	32.97
-	35.41	38.52	40.04	-	-	35.65	36.82	36.84	-	-	37.14	37.66	36.87
-	14.34	13.37	13.82	-	-	14.00	12.70	11.98	-	-	13.17	14.32	14.00
-	0.96	1.06	0.91	-	-	0.92	1.00	0.89	-	-	0.93	0.77	0.92
-	8.13	8.40	7.66	-	-	7.73	7.80	7.35	-	-	7.65	6.95	7.68
-	5.59	5.70	4.92	-	-	5.17	4.92	3.28	-	-	4.56	4.05	5.17
-	3.1	5.4	5.8	-	-	3.2	5.0	4.4	-	-	3.9	3.3	4.1
-	4.8	7.4	8.1	-	-	5.3	7.2	7.0	-	-	5.8	5.6	6.0
-	4.39	4.34	4.60	-	-	4.52	3.80	3.55	-	-	4.50	4.23	4.39
-	0.8883	0.8760	0.8793	-	-	0.8948	0.8977	0.8573	-	-	0.8878	0.8949	0.8942

TABLE D1

MASSECUITES, EXHAUSTIONS, CLARIFYING AGENTS AND ADDITIONAL FUELS SOUTH AFRICAN MILLS (SEASON 1994 – 1995)

SYMBOLS OF FACTORIES	ML	KM	PG	UF	EN	FX	AK	DL	MS	ME	GD	GH	NB	UC	SZ	UK	INDUSTRY
A - MASSECUITE																	
M3 PER TON BRIX IN MIXED JUICE	1.14	1.00	0.99	0.92	0.95	0.93	0.95	0.94	0.93	1.05	0.95	0.96	0.94	0.97	1.01	0.94	0.97
REF BRIX OF MASSECUITE	93.97	92.26	92.05	92.49	92.85	92.71	93.43	93.36	93.30	92.51	93.00	92.80	92.98	92.89	93.16	92.68	92.97
PURITY OF MASSECUITE	82.80	78.47	84.73	85.37	84.50	84.29	82.82	82.27	82.54	83.05	82.94	83.14	86.09	86.32	82.84	82.02	83.49
PURITY OF A - MOLASSES	62.37	61.33	66.55	68.43	65.06	66.16	63.16	60.86	61.31	66.62	64.87	62.96	67.63	66.90	61.65	61.25	63.99
PURITY DROP	20.43	17.14	18.18	16.94	19.44	18.13	19.66	21.41	21.23	16.43	18.07	20.18	18.46	19.42	21.19	20.77	19.50
EXHAUSTION	65.57	56.48	64.14	62.85	65.84	63.56	64.44	66.49	66.48	59.27	62.02	65.53	66.24	67.97	66.70	65.35	64.86
PTY OF A-MASS - PURITY SYRUP	0.78	0.52	1.39	1.19	0.17	2.39	0.55	0.86	1.40	0.07	0.77	1.90	0.38	0.19	0.29	-0.44	0.96
PTY OF REMELT	83.58	80.17	84.30	84.25	85.86	87.81	85.28	84.66	84.40	85.22	86.39	83.88	83.42	85.48	81.70	81.81	84.20
B - MASSECUITE																	
M3 PER TON BRIX IN MIXED JUICE	0.35	0.42	0.42	0.43	0.25	0.39	0.28	0.30	0.39	0.38	0.38	0.39	0.31	0.31	0.26	0.34	0.35
REF BRIX OF MASSECUITE	96.28	95.64	94.62	95.21	95.07	94.76	95.01	95.71	93.92	93.43	94.70	95.00	96.18	96.07	94.53	93.65	94.95
PURITY OF MASSECUITE	63.97	61.14	70.29	68.52	66.92	69.81	64.50	63.23	62.79	67.01	66.04	64.30	67.49	69.23	63.66	62.62	65.93
PURITY OF B - MOLASSES	41.50	42.73	47.67	47.20	44.68	45.22	42.29	42.33	43.04	45.65	43.59	41.75	44.92	41.38	39.79	41.83	43.58
PURITY DROP	22.47	18.41	22.62	21.32	22.24	24.59	22.21	20.90	19.75	21.36	22.45	22.55	22.57	27.85	23.87	20.79	22.36
EXHAUSTION	60.04	52.58	61.50	58.93	60.08	64.30	59.67	57.32	55.22	58.65	60.26	60.21	60.72	68.63	62.28	57.07	60.10
C - MASSECUITE																	
M3 PER TON BRIX IN MIXED JUICE	0.29	0.16	0.31	0.25	0.27	0.36	0.28	0.30	0.31	0.29	0.29	0.28	0.23	0.21	0.30	0.32	0.29
REF BRIX OF MASSECUITE	97.73	96.41	97.00	97.47	96.66	96.40	97.14	97.09	97.32	96.98	96.02	96.84	97.60	97.99	95.97	96.03	96.88
PURITY OF MASSECUITE	52.58	48.17	52.03	53.22	53.64	56.82	53.05	52.58	53.54	53.93	49.49	50.71	52.79	51.17	53.67	51.82	53.10
PURITY OF C - MOLASSES	29.59	31.05	33.46	36.42	34.03	34.27	34.08	32.31	31.45	33.75	35.21	31.90	33.05	31.58	32.97	33.71	32.97
CRYSTAL CONTENT	31.91	23.94	27.07	25.76	28.74	33.07	27.95	29.08	31.36	29.54	21.16	26.74	28.77	28.05	29.64	26.24	29.10
EXHAUSTION	62.10	51.55	53.64	49.65	55.43	60.38	54.24	56.96	60.19	56.49	44.54	54.46	55.84	55.95	57.54	52.73	56.56
TOTAL VOLUME ALL RAW MASSECUITES M3 PER TON BRIX IN MIXED JUICE	1.78	1.58	1.71	1.60	1.46	1.69	1.51	1.53	1.63	1.72	1.61	1.64	1.48	1.50	1.57	1.61	1.61
WHITE SUGAR MASSECUITES KG SUGAR PER M3 MASSECUITE	-	-	674	768	-	-	-	-	-	-	-	619	481	-	-	-	606
TONS LIMESTONE PER 1000 TONS WHITE SUGAR	-	-	54.11	-	-	-	-	-	-			37.32	-	-	-	-	-
TONS COKE/1000 TONS WHITE SUGAR	-	-	6.16	-	-	-	-	-	-	-	-	5.50	-	-	-	-	-
TONS PHOS ACID/1000 TONS WHITE SUGAR	-	-	-	-	-	-	-	-	-	-	-	-	1.06	-	-	-	-
TONS SULPHUR/1000 TONS WHITE SUGAR	-	-	0.07	5.16	-	-	-	-	-	-	-	0.08	-	-	-	-	-
PHOS. ACID PPM MIXED JUICE	-	-	-	-	-	-	0.24	-	-	-	-	-	4.39	28.54	-	32.82	-
FLOCCULANT PPM MIXED JUICE	4.01	16.93	4.53	16.49	0.60	3.62	2.55	2.27	2.84	2.32	8.51	4.08	5.43	3.21	2.58	0.76	4.49
TONS LIME PER 1000 TC	0.84	1.06	-	1.26	0.77	0.84	0.73	0.52	0.20	0.57	0.56	-	0.71	0.52	-	1.29	0.55
ENZYME PPM SUGAR	0.00	0.00	0.00	0.00	10.10	0.00	0.00	11.00	10.30	0.00	43.80	14.50	0.00	0.00	6.50	3.40	4.43
ADDITIONAL FUELS PER 1000 TC																	
TONS OF COAL	75.40	24.81	15.18	14.81	19.43	27.25	2.01	1.62	22.47	-	-	-	3.20	6.54	-	-	-
TONS OF WOOD	-	0.11	0.26	-	0.47	-	0.12	-	0.04	-	-	-	0.18	0.54	-	-	-
CONVERTED INTO BAGASSE **	301.59	99.37	61.02	59.24	78.28	108.98	8.20	6.49	89.94	-	-	-	13.01	26.79	-	-	-

** 1 TON COAL EQUIVALENT TO 4 TONS OF BAGASSE
1 TON FIREWOOD EQUIVALENT TO 1,2 TONS OF BAGASSE

TABLE B2

CANE CRUSHED AND SUGAR MADE, CANE COMPOSITION, THROUGHPUTS AND TIME ACCOUNTS, PERFORMANCES AND LOSSES SWAZILAND, MALAWI AND ZIMBABWE MILLS (SEASON 1994 – 1995)

SYMBOLS OF FACTORIES	MH-A *	MH-B	MH-AVE	UR-A *	UR-B	UR-AVE	SM	NH-A *	NH-B	NH-AVE	DW	HV-A *	HV-B *	HV-AVE	TR-A *	TR-B *	TR-AVE
TONS SUGAR MADE AND ESTIMATED	-	-	165912	-	-	172193	147187	-	-	108951	84678	-	-	296336	-	-	226816
REFINED % TOTAL SUGAR	-	-	-	-	-	56.12	-	-	-	44.28	77.16	-	-	-	-	-	-
MOISTURE ALL SUGAR	-	-	0.16	-	-	0.20	0.22	-	-	0.08	0.06	-	-	0.18	-	-	0.33
POL ALL SUGAR	-	-	99.05	-	-	99.30	98.96	-	-	99.38	99.73	-	-	98.79	-	-	98.77
TONS CANE CRUSHED TOTAL			1264117			1405478	1128340			1056722	677312			2317753			1926500
TONS CANE CRUSHED PER TANDEM	578615	685502		780471	625007			1056722	-			1146120	1171633		1376221	550279	
SEASON STARTED ON	-	-	02/05/94	-	-	27/04/94	08/04/94	-	-	07/04/94	04/05/94	-	-	22/03/94	-	-	23/03/94
SEASON COMPLETED ON	-	-	04/01/95	-	-	12/01/95	04/11/94	-	-	30/10/94	12/11/94	-	-	21/11/94	-	-	30/11/94
NUMBER OF CRUSHING DAYS	-	-	247	-	-	260	210	-	-	206	192	-	-	244	-	-	252
TIME ACCOUNT																	
OVERAL TIME EFFICIENCY %	72.88	88.63	80.74	83.96	85.36	84.66	81.56	79.77	-	79.77	90.66	90.21	91.44	90.82	92.70	62.86	78.29
SCHED.STOPS% GROSS AVAIL.TIME	4.49	4.16	4.32	3.16	3.00	3.08	4.21	6.97	-	6.97	4.31	3.14	3.09	3.12	3.24	25.78	14.12
LACK OF CANE % GROSS	15.58	4.26	9.93	2.18	2.29	2.23	6.01	2.10	-	2.10	0.66	0.01	0.00	0.00	0.87	2.73	1.77
OTHER STOPS % GROSS	7.05	2.95	5.00	10.70	9.36	10.03	8.23	11.15	-	11.15	4.37	6.64	5.47	6.06	3.19	8.63	5.82
LOST TIME % AVAIL.CRUSH.TIME	8.82	3.22	5.83	11.31	9.88	10.59	9.16	12.26	-	12.26	4.60	6.86	5.65	6.25	3.33	12.08	6.92
THROUGHPUTS PER CRUSHING HOUR																	
TONS CANE	145.73	142.60	288.32	157.20	123.90	281.10	298.57	267.07	-	267.07	161.86	220.69	221.48	442.18	245.70	155.06	400.76
TONS FIBRE	19.92	20.54	40.46	21.61	16.37	37.98	37.45	42.02	-	42.02	24.17	31.66	31.86	63.52	34.86	21.50	56.36
TONS BRIX IN MIXED JUICE	23.61	23.56	47.17	24.99	19.50	44.50	48.57	37.82	-	37.82	27.17	36.32	35.46	71.78	38.26	24.09	62.36
TONS POL IN MIXED JUICE	20.53	20.52	41.05	21.30	16.64	37.94	41.83	31.92	-	31.92	23.34	31.25	30.59	61.84	32.78	20.59	53.38
TONS NON-POL. IN MIXED JUICE	3.08	3.04	6.12	3.69	2.86	6.56	6.74	5.90	-	5.90	3.83	5.07	4.87	9.93	5.48	3.50	8.98
TONS OF SUGAR PRODUCED	-	-	18.90	-	-	17.20	38.95	-	-	27.54	20.24	-	-	28.27	-	-	24.79
COMPOSITION OF CANE CRUSHED																	
POL % CANE	14.47	14.62	14.55	13.87	13.85	13.86	14.48	12.42	-	12.42	14.62	14.47	14.13	14.30	13.58	13.72	13.62
FIBRE % CANE	14.36	14.53	14.45	14.02	14.07	14.05	13.35	15.73	-	15.73	14.93	14.59	14.62	14.61	14.36	14.40	14.37
BRIX % CANE	16.87	16.99	16.94	16.51	16.49	16.50	17.01	14.92	-	14.92	17.25	17.09	16.64	16.86	16.04	16.30	16.12
ASH % CANE	-	-	-	-	-	-	0.78	-	-	-	-	0.50	0.50	0.50	-	-	-
ERC % CANE	12.60	12.76	12.69	11.90	11.88	11.89	12.56	10.53	-	10.53	12.61	12.49	12.20	12.34	11.70	11.77	11.72
ERC % POL IN CANE	87.08	87.29	87.19	85.78	85.76	85.77	86.74	84.74	-	84.74	86.29	86.27	86.39	86.33	86.17	85.82	86.07
EXTRACTION																	
EXTRACTION (POL BASED)	97.36	98.46	97.96	97.69	96.96	97.37	96.77	96.19	-	96.19	98.66	97.83	97.79	97.81	98.25	96.82	97.83
CORRECTED REDUCED EXTRACTION	96.77	98.20	97.56	97.25	96.23	96.81	95.64	96.36	-	96.36	98.49	97.47	97.47	97.47	98.01	96.28	97.52
IMBIBITION % CANE	53.47	54.68	54.13	46.99	41.99	44.76	41.37	41.46	-	41.46	44.23	56.51	54.26	55.38	52.02	53.05	52.31
IMBIBITION % FIBRE	391	380	385	342	318	331	330	264	-	264	296	394	377	385	367	383	371
PREPARATION INDEX	91	92	91	92	92	92	90	89	-	89	91	93	93	93	93	92	92
POL FACTOR	97.65	99.49	98.65	98.99	98.88	98.94	98.90	-	-	-	98.95	100.20	100.20	100.20	-	-	-
BRIX FACTOR	99.71	101.05	100.43	100.51	100.43	100.47	100.07	-	-	-	100.59	100.99	100.97	100.98	-	-	-
RECOVERIES																	
BOILING HOUSE RECOVERY (POL)	-	-	91.22	-	-	90.13	92.13	-	-	85.74	-	-	-	90.31	-	-	87.27
OVERALL RECOVERY (POL)	-	-	89.36	-	-	87.75	89.16	-	-	82.47	-	-	-	88.34	-	-	85.38
TON CANE PER TON SUGAR	-	-	7.62	-	-	8.16	7.67	-	-	9.70	8.00	-	-	7.82	-	-	8.49
TON CANE PER TON 96 SUGAR	-	-	7.31	-	-	7.84	7.36	-	-	9.31	7.68	-	-	7.51	-	-	8.15
BALANCES																	
POL LOST % POL IN CANE																	
- LOST IN BAGASSE (A)	-	-	2.04	-	-	2.63	3.23	-	-	3.81	1.34	-	-	2.19	-	-	2.17
- LOST IN FILTER CAKE (B)	-	-	0.09	-	-	0.07	0.25	-	-	0.03	0.15	-	-	0.12	-	-	0.18
- LOST IN FINAL MOLASSES (C)	-	-	6.57	-	-	8.23	7.12	-	-	12.94	-	-	-	7.71	-	-	10.62
- UNDETERMINED LOSSES (D)	-	-	1.94	-	-	1.31	0.24	-	-	0.75	-	-	-	1.65	-	-	1.66
BOILING HOUSE LOSSES(B+C+D)	-	-	8.60	-	-	9.61	7.61	-	-	13.72	-	-	-	9.47	-	-	12.46
SUM OF ALL LOSSES(A+B+C+D)	-	-	10.64	-	-	12.25	10.84	-	-	17.53	-	-	-	11.66	-	-	14.62
NON POL RATIO	-	-	1.05	-	-	1.01	0.95	-	-	1.07	-	-	-	1.04	-	-	1.07

* CANE DIFFUSER

TABLE C2

ANALYSIS OF BAGASSE, JUICES, FILTER CAKE, SYRUP AND FINAL MOLASSES SWAZILAND, MALAWI AND ZIMBABWE MILLS (SEASON 1994 – 1995)

SYMBOLS OF FACTORIES	MH-A *	MH-B	MH-AVE	UR-A *	UR-B	UR-AVE	SM	NH-A *	NH-B	NH-AVE	DW	HV-A *	HV-B *	HV-AVE	TR-A *	TR-B *	TR-AVE
FINAL BAGASSE																	
POL % BAGASSE	1.36	0.75	1.02	1.06	1.48	1.24	1.75	1.38	-	1.38	0.69	1.07	1.07	1.07	0.84	1.49	1.03
MOISTURE % BAGASSE	48.95	50.29	49.70	52.45	51.08	51.86	50.12	51.78	-	51.78	45.86	49.16	48.75	48.95	48.39	50.01	48.86
FIBRE % BAGASSE	48.65	48.14	48.36	45.54	46.30	45.87	47.08	46.00	-	46.00	52.51	48.68	49.11	48.90	49.96	47.39	49.21
BAGASSE % CANE	28.09	29.93	29.09	30.18	28.54	29.45	26.64	34.21	-	34.21	28.43	29.48	29.29	29.38	28.40	29.25	28.64
ASH % BAGASSE	-	-	-	-	-	-	1.43	-	-	-	-	1.71	-	1.71	-	-	-
LCV IN KJ PER KG BAGASSE ##			-			-	7537			-	-			7744			-
MIXED JUICE																	
MIXED JUICE % CANE	125.38	124.75	125.04	116.80	113.45	115.31	114.73	107.26	-	107.26	115.79	127.04	124.98	125.99	123.62	123.80	123.67
BRIX % MIXED JUICE	12.92	13.24	13.10	13.61	13.88	13.73	14.18	13.20	-	13.20	14.50	12.95	12.81	12.88	12.60	12.55	12.58
APPARENT PURITY	86.95	87.11	87.04	85.22	85.33	85.27	86.13	84.40	-	84.40	85.90	86.05	86.27	86.16	85.67	85.48	85.62
PURITY DIFFERENCE(MJ - DAC)	-0.59	-0.26	-0.41	-0.10	0.01	-0.05	0.02	-	-	-	-0.24	0.70	0.72	0.71	-	-	-
SUSPENDED SOLIDS % MIXED JUICE	0.55	0.10	0.31	0.24	0.76	0.47	0.70	-	-	-	-	0.19	0.19	0.19	0.14	0.43	0.22
CLARIFIED JUICE																	
BRIX % CLARIFIED JUICE	-	-	13.03	-	-	13.73	13.70	-	-	13.08	14.32	-	-	12.90	-	-	12.03
APPARENT PURITY	-	-	87.48	-	-	85.93	86.05	-	-	85.13	86.94	-	-	85.50	-	-	84.92
PURITY DIFFERENCE(CJ - MJ)	-	-	0.44	-	-	0.66	-0.08	-	-	0.73	1.04	-	-	-0.66	-	-	-0.70
AVERAGE PH	-	-	7.2	-	-	7.1	7.1	-	-	7.1	6.6	-	-	6.9	-	-	6.8
FILTER CAKE																	
POL % FILTER CAKE	-	-	0.60	-	-	0.53	1.25	-	-	0.85	1.07	-	-	2.51	-	-	0.99
MOISTURE % FILTER CAKE	-	-	72.95	-	-	-	76.57	-	-	73.64	71.12	-	-	76.10	-	-	-
FILTER CAKE % CANE	-	-	2.06	-	-	1.92	2.89	-	-	0.46	2.02	-	-	0.66	-	-	2.48
FILTER WASH INDEX	-	-	100.5	-	-	100.0	103.5	-	-	100.9	101.3	-	-	99.9	-	-	104.6
PURITY DIFF.(CJ - FILTRATE)	-	-	2.09	-	-	-	1.15	-	-	5.84	-	-	-	1.20	-	-	1.92
SYRUP																	
BRIX % SYRUP	-	-	64.12	-	-	63.80	67.33	-	-	66.15	62.23	-	-	62.79	-	-	67.22
APPARENT PURITY	-	-	87.02	-	-	85.97	85.43	-	-	85.17	86.58	-	-	86.03	-	-	85.22
PURITY DIFFERENCE(SYRUP - MJ)	-	-	-0.02	-	-	0.70	-0.70	-	-	0.77	0.68	-	-	-0.13	-	-	-0.40
AVERAGE PH	-	-	6.1	-	-	6.4	6.2	-	-	6.6	6.2	-	-	6.1	-	-	6.2
FINAL MOLASSES																	
REFRACTO BRIX	-	-	82.83	-	-	84.52	83.77	-	-	80.53	-	-	-	83.96	-	-	85.02
POL/REFRACTO BRIX PURITY	-	-	31.10	-	-	33.20	33.70	-	-	41.04	-	-	-	33.27	-	-	38.77
PURITY DIFFERENCE(TRUE-TARGET)	-	-	-	-	-	4.69	-	-	-	5.51	-	-	-	7.96	-	-	-
REDUCING SUGARS % #	-	-	17.71	-	-	18.02	18.90	-	-	12.34	-	-	-	15.85	-	-	-
SULPHATED ASH %	-	-	-	-	-	14.86	14.66	-	-	16.32	-	-	-	12.71	-	-	12.82
REDUCING SUGARS/ASH RATIO	-	-	-	-	-	1.21	1.29	-	-	0.76	-	-	-	1.25	-	-	-
FINAL MOL AT 85 BRIX % CANE	-	-	3.62	-	-	4.04	3.60	-	-	4.61	-	-	-	3.90	-	-	4.39

* CANE DIFFUSER

\# REDUCING SUGARS DETERMINED BY LANE & EYNON METHOD.

LCV = 18309 - 31,14 Bx % BAGASSE - 207,63 MOISTURE % BAGASSE - 196,05 ASH % BAGASSE

TABLE D2

MASSECUITES, EXHAUSTIONS, CLARIFYING AGENTS AND ADDITIONAL FUELS SWAZILAND, MALAWI AND ZIMBABWE MILLS (SEASON 1994 - 1995)

SYMBOLS OF FACTORIES	MH	UR	SM	NH	DW	HV	TR
A - MASSECUITE							
M3 PER TON BRIX IN MIXED JUICE	1.03	1.13	0.99	1.32	1.32	1.04	0.91
REF BRIX OF MASSECUITE	92.68	92.60	92.95	91.97	91.97	92.01	92.59
PURITY OF MASSECUITE	86.46	84.99	86.06	85.70	89.79	86.63	84.62
PURITY OF A - MOLASSES	67.61	68.80	67.26	73.98	78.04	69.67	66.13
PURITY DROP	18.85	16.19	18.80	11.72	11.75	16.96	18.49
EXHAUSTION	67.31	61.06	66.72	52.56	59.59	64.55	64.51
PURITY OF A-MASS - PTY SYRUP	-0.56	-0.98	0.63	0.53	3.21	0.60	-0.60
PURITY OF REMELT	81.84	85.83	85.06	98.83	91.44	86.88	88.05
B - MASSECUITE							
M3 PER TON BRIX IN MIXED JUICE	0.35	0.42	0.29	0.56	0.72	0.40	0.33
REF BRIX OF MASSECUITE	94.33	94.21	96.25	95.72	92.56	93.91	94.61
PURITY OF MASSECUITE	68.79	68.67	67.88	74.25	73.00	70.67	66.65
PURITY OF B - MOLASSES	44.02	44.16	44.20	55.27	45.47	49.77	45.08
PURITY DROP	24.77	24.51	23.68	18.98	27.53	20.90	21.57
EXHAUSTION	64.32	63.92	62.52	57.15	69.16	58.88	58.93
C - MASSECUITE							
M3 PER TON BRIX IN MIXED JUICE	0.23	0.23	0.23	-	-	-	-
REF BRIX OF MASSECUITE	97.36	97.24	98.14	-	-	-	-
PURITY OF MASSECUITE	51.74	50.93	54.60	-	-	-	-
PURITY OF C - MOLASSES	31.10	33.20	33.70	41.04	-	33.27	38.77
CRYSTAL CONTENT	29.17	25.81	30.94	-	-	-	-
EXHAUSTION	57.91	52.11	57.74	-	-	-	-
TOTAL VOLUME ALL RAW MASSECUITES							
M3 PER TON BRIX IN MIXED JUICE	1.61	1.78	1.51	1.88	2.04	1.43	1.24
WHITE SUGAR MASSECUITES							
KG SUGAR PER M3 MASSECUITE	-	673	-	560	570	-	-
TONS PHOS ACID/1000 TONS WHITE SUGAR	-	-	-	0.62	-	-	-
TONS SULPHUR/1000 TONS WHITE SUGAR	-	0.06	-	0.27	0.08	-	-
PHOS. ACID PPM MIXED JUICE	-	-	-	19.4	-	-	-
FLOCCULANT PPM MIXED JUICE	1.9	1.7	2.2	5.3	1.4	1.4	1.1
TONS LIME PER 1000 TC	0.4	0.5	0.4	1.0	1.3	-	-
ENZYME PPM SUGAR	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ADDITIONAL FUELS PER 1000 TC							
TONS OF COAL	4.19	16.11	1.77	-	-	3.90	6.68
TONS OF WOOD	-	-	-	0.13	0.17	-	-
CONVERTED INTO BAGASSE	16.76	64.43	7.08	0.16	0.20	15.62	26.73

TABLE E

COMPARATIVE MANUFACTURING DATA OF RECENT YEARS (SOUTH AFRICAN MILLS)

SEASON	1994/95	1993/94	1992/93	1991/92	1990/91
THROUGHPUT AND TIME EFFICIENCY					
TONS CANE PER HOUR	248.90	249.90	252.34	275.87	268.96
TONS FIBRE PER HOUR	37.49	39.55	37.86	40.02	39.50
TIME EFFICIENCY	78.13	76.77	79.37	81.10	81.17
CANE					
SUCROSE % CANE	12.54	12.53	13.82	13.04	12.91
FIBRE % CANE	15.49	16.23	15.40	14.93	15.14
MIXED JUICE					
SUCROSE PURITY	83.66	83.14	83.61	86.39	86.23
(GLUC. + FRUCT.)/ASH IN M.J.	1.26	1.03	1.41	1.15	1.15
MILLING					
IMBIBITION % FIBRE	366	380	387	375	368
EXTRACTION (SUCROSE BASED)	97.87	97.75	97.81	97.95	97.75
POL % BAGASSE	0.83	0.83	0.93	0.87	0.92
MOISTURE % BAGASSE	51.27	51.52	51.92	51.18	51.62
BAGASSE % CANE	32.05	33.88	32.48	30.82	31.54
LCV BAGASSE KJ/KG	6878	6952	6989	7197	7022
AVAIL. KJ IN BAG./KG BRIX IN M.J.	15025	15985	14034	14999	15136
RECOVERIES					
BOILING HOUSE RECOVERY (SUCROSE BASED)	86.50	85.05	85.90	88.88	88.50
OVERALL RECOVERY (SUCROSE BASED)	84.66	83.14	84.02	87.06	86.51
TONS CANE PER TON SUGAR	9.37	9.56	8.57	8.77	8.92
FILTER CAKE					
POL % FILTER CAKE	0.88	0.92	1.04	1.20	1.15
FILTER CAKE % CANE	3.18	3.35	3.36	2.94	3.27
FINAL MOLASSES					
BRIX % FINAL MOLASSES	82.20	82.01	81.18	82.43	81.99
SUCROSE/REFRACTO BRIX PURITY	36.87	38.21	37.38	37.10	36.99
TONS FIN.MOLASSES AT 85 BX % CANE	4.39	4.66	4.92	3.67	3.70
AVERAGE SUGAR POLARISATION	99.50	99.58	99.59	99.59	99.58
SUCROSE LOST % SUCROSE IN CANE					
LOST IN BAGASSE	2.13	2.25	2.19	2.05	2.25
LOST IN FILTER CAKE	0.22	0.25	0.25	0.27	0.29
LOST IN FINAL MOLASSES	10.97	12.07	11.31	8.86	9.02
UNDETERMINED LOSSES	2.01	2.29	2.23	1.76	1.92
LOST IN BOILING HOUSE	13.21	14.61	13.79	10.89	11.24
TOTAL LOSSES	15.34	16.86	15.98	12.94	13.49
M3 MASSECUITE PER TON BX IN M.J.					
A - MASSECUITE	0.97	1.00	1.00	1.00	1.00
B - MASSECUITE	0.35	0.36	0.34	0.33	0.34
C - MASSECUITE	0.29	0.31	0.29	0.24	0.25
TOTAL	1.61	1.67	1.63	1.56	1.59
EXHAUSTION OF MASSECUITES					
A - MASSECUITE	64.86	63.79	64.42	66.69	66.36
B - MASSECUITE	60.10	58.38	59.84	62.21	61.88
C - MASSECUITE	56.56	52.89	54.00	54.68	53.89
BRIX OF SYRUP	64.93	64.47	65.35	64.60	64.68

TABLE F

AVERAGE MANUFACTURING RESULTS BY MONTHLY PERIODS FOR SOUTH AFRICAN MILLS (SEASON 1994 - 1995)

END OF MONTH PERIOD		30 APR 1994	28 MAY 1994	2 JULY 1994	30 JULY 1994	27 AUG 1994	1 OCT 1994	29 OCT 1994	3 NOV 1994	31 DEC 1994	28 JAN 1995	25 FEB 1995
TONS OF SUGAR MADE AND ESTIMATED	MONTH	9606	108355	288884	236215	237710	304312	208957	214622	49039	12453	3512
	TO-DATE	9606	117961	406845	643060	880769	1185081	1394038	1608661	1657699	1670153	1673664
TONS CANE CRUSHED	MONTH	98113	1094702	2629623	2104134	2138229	2738593	1914287	2230529	538592	134479	62009
	TO-DATE	98113	1192815	3822438	5926572	8064801	10803394	12717681	14948210	15486802	15621281	15683290
TONS CANE CRUSHED PER HOUR ACTUAL CRUSHING	MONTH	160.33	226.95	255.59	254.69	252.04	252.77	256.23	235.00	270.45	163.62	-
	TO-DATE	160.33	219.45	243.10	247.09	248.38	249.48	250.47	248.04	248.75	247.65	248.90
SUCROSE % CANE	MONTH	12.03	11.86	12.77	13.14	12.82	12.94	12.74	11.52	11.49	11.53	10.26
	TO-DATE	12.03	11.87	12.49	12.72	12.75	12.80	12.79	12.60	12.56	12.55	12.54
FIBRE % CANE	MONTH	13.40	14.91	14.44	14.63	15.16	15.46	16.31	17.11	17.21	15.85	15.38
	TO-DATE	13.40	14.78	14.55	14.58	14.73	14.92	15.12	15.42	15.48	15.49	15.49
TONS CANE PER TON SUGAR	MONTH	10.21	10.10	9.10	8.91	9.00	9.00	9.16	10.39	10.98	10.80	-
	TO-DATE	10.21	10.11	9.40	9.22	9.16	9.12	9.12	9.29	9.34	9.35	9.37
EXTRACTION (SUCROSE BASED)	MONTH	95.36	97.64	97.90	98.00	98.00	97.95	97.93	97.69	97.60	97.56	97.33
	TO-DATE	95.36	97.45	97.77	97.85	97.89	97.91	97.91	97.88	97.87	97.87	97.87
IMBIBITION % FIBRE	MONTH	298	370	377	372	370	365	366	355	356	284	351
	TO-DATE	298	365	373	373	372	370	369	367	367	366	366
POL % BAGASSE	MONTH	1.82	0.88	0.88	0.86	0.82	0.84	0.80	0.75	0.75	0.88	0.90
	TO-DATE	1.82	0.96	0.91	0.89	0.87	0.86	0.85	0.84	0.83	0.83	0.83
MOISTURE % BAGASSE	MONTH	54.25	52.40	52.00	51.50	51.00	50.88	50.25	51.17	52.29	48.67	48.41
	TO-DATE	54.25	52.55	52.18	51.94	51.69	51.48	51.28	51.26	51.31	51.28	51.27
BOILING HOUSE RECOVERY (SUCROSE BASED)	MONTH	85.22	84.97	87.36	86.75	88.03	87.20	86.98	84.94	80.66	82.13	-
	TO-DATE	85.22	84.99	86.66	86.70	87.05	87.09	87.07	86.78	86.59	86.55	86.50
OVERALL RECOVERY (SUCROSE BASED)	MONTH	81.27	82.97	85.53	85.02	86.28	85.41	85.17	82.98	78.72	80.12	-
	TO-DATE	81.27	82.83	84.73	84.83	85.22	85.27	85.25	84.94	84.75	84.71	84.66
MIXED JUICE SUCROSE PURITY	MONTH	82.10	82.60	82.96	83.72	84.35	84.52	84.63	83.04	81.69	81.89	78.22
	TO-DATE	82.10	82.56	82.84	83.16	83.48	83.74	83.87	83.76	83.69	83.68	83.66
POL/SUC. RATIO IN MIXED JUICE	MONTH	0.9810	0.9769	0.9777	0.9790	0.9843	0.9861	0.9880	0.9880	0.9852	0.9856	0.9897
	TO-DATE	0.9810	0.9772	0.9776	0.9781	0.9798	0.9814	0.9824	0.9831	0.9832	0.9832	0.9832
SUCROSE/REFRACTO BRIX PURITY IN FINAL MOLASSES	MONTH	37.04	36.10	34.83	35.85	37.18	37.14	38.14	37.95	40.15	37.79	41.82
	TO-DATE	37.04	36.18	35.25	35.46	35.90	36.21	36.49	36.71	36.84	36.85	36.87
SUCROSE LOST IN FINAL MOLASSES % SUCROSE IN CANE	MONTH	12.01	11.44	10.52	10.26	10.53	10.47	10.77	12.29	14.16	13.92	17.44
	TO-DATE	12.01	11.49	10.80	10.61	10.58	10.56	10.59	10.82	10.93	10.95	10.97
UNDETERMINED LOST SUCROSE % SUCROSE IN CANE	MONTH	1.84	2.97	1.65	2.50	0.97	1.85	1.77	2.18	4.51	3.15	-
	TO-DATE	1.84	2.88	2.02	2.19	1.87	1.86	1.85	1.89	1.98	1.99	2.01
POL/SUCROSE RATIO FM	MONTH	0.8641	0.8553	0.8296	0.8425	0.8921	0.9272	0.9318	0.9558	0.9242	0.9031	0.8749
	TO-DATE	0.8641	0.8561	0.8379	0.8395	0.8535	0.8723	0.8813	0.8929	0.8942	0.8943	0.8942

TABLE G

CANE VARIETIES AND RAINFALL (SEASON 1994 - 1995) PERCENTAGE BY WEIGHT

MILL	N 11	N 12	N 13	N 14	N 16	N 17	N 18	N 19	N 52/219	N 55/805	NCo 293	NCo 310	NCo 376	NCo 382	MIXED VARIET	UNKNOWN AND OTHER	% BURNT	* RAINFALL MM
ML	-	-	-	70.1	-	2.3	-	15.5	-	-	-	-	-	-	0.2	11.9	100.0	80
KM	-	-	-	67.4	-	1.5	0.1	17.8	-	-	-	-	-	-	1.9	11.3	100.0	343
PG	-	-	-	47.1	-	3.3	-	39.8	-	-	-	-	0.1	-	0.8	8.8	100.0	348
UF	-	6.4	-	18.5	-	16.0	0.8	13.7	0.1	-	-	3.0	33.7	-	6.3	1.5	98.5	268
EN	0.1	35.0	0.5	1.3	9.3	0.7	-	-	-	-	1.5	0.1	29.8	-	-	21.7	98.4	328
FX	-	4.7	-	7.4	0.1	5.3	1.1	3.8	-	-	-	-	32.4	-	1.4	43.8	87.4	545
AK	-	17.7	0.2	1.6	1.7	2.6	0.2	0.9	-	-	-	0.1	33.1	-	8.3	33.6	90.8	341
DL	-	16.8	1.2	2.5	6.9	1.6	0.6	0.5	-	0.1	-	0.1	65.7	-	4.1	0.1	70.7	396
MS	-	28.3	0.2	1.6	10.0	1.6	0.3	0.3	-	1.1	0.1	0.1	36.1	-	7.5	12.7	85.6	365
ME	1.2	34.1	0.6	1.3	9.0	0.2	-	0.2	-	0.3	3.7	-	46.8	-	2.5	0.2	93.3	216
GD	0.1	8.1	-	7.8	9.2	3.2	0.2	0.8	-	-	-	-	70.5	-	-	-	94.7	259
GH	-	25.4	0.2	2.3	3.9	1.2	0.3	0.2	-	0.9	-	0.1	36.9	-	3.8	24.7	79.8	366
NB	2.2	73.7	0.1	0.5	13.6	0.1	0.1	-	-	-	2.5	-	2.4	0.1	0.4	4.4	99.6	229
UC	1.5	71.7	0.2	0.1	14.5	0.1	-	-	-	-	6.7	-	4.6	-	0.1	0.5	80.3	264
SZ	0.2	41.8	0.4	0.9	6.9	0.3	0.2	-	-	0.6	0.8	0.8	35.8	-	3.0	8.3	69.8	469
UK	0.1	34.2	0.4	3.3	4.0	0.3	0.2	-	0.1	-	1.2	0.2	28.1	-	2.0	26.4	92.9	341
AVERAGE SA MILLS	0.3	24.8	0.2	12.9	5.0	2.7	0.3	5.9	-	0.3	0.8	0.3	28.1	-	3.2	15.0	87.8	
MH	-	-	-	16.3	-	3.5	-	17.7	-	-	-	-	61.7	-	0.2	0.6	-	268
UR	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SM	-	-	-	28.6	-	1.5	-	7.6	-	-	-	-	61.0	-	0.9	0.4	-	66
NH	-	-	-	83.4	-	0.3	-	4.1	-	-	-	-	3.3	-	3.8	4.7	-	41
DW	-	-	-	35.8	-	0.1	-	3.6	0.2	-	-	-	26.7	-	2.1	31.6	-	94
HV	-	-	-	6.6	-	-	-	-	-	-	-	-	93.1	-	-	0.3	-	6
TR	-	-	-	11.5	-	-	-	-	-	-	-	-	87.3	-	1.2	-	-	56

* RAINFALL DURING THE CRUSHING SEASON

TABLE H

TRANSPORT SUMMARY SOUTH AFRICAN MILLS (SEASON 1994 - 1995) PERCENT OF CANE TRANSPORTED

MILLS	ML	KM	PG	UF	EN	FX	AK	DL	MS	ME	GD	GH	NB	UC	SZ	UK	AVERAGE
SOUTH AFRICAN RAILWAYS	-	-	-	-	-	19.9	-	-	-	-	-	-	-	-	-	-	2.0
TRAMS	-	-	-	67.1	-	-	-	-	-	-	-	-	-	-	-	-	4.1
ARTICULATED TRUCK DRIVEN VEHICLES																	
- INTERLINK	-	-	0.5	23.3	-	53.5	63.4	4.7	45.5	61.5	-	6.7	28.3	8.1	71.0	39.5	32.0
- TRI-AXLE	-	-	-	-	-	1.9	-	34.9	34.8	3.6	-	41.8	0.2	2.9	-	-	9.0
- HILO	93.8	99.8	14.6	7.1	1.4	10.7	10.9	29.2	0.9	3.2	47.9	26.4	6.0	13.4	17.4	5.3	20.7
RIGID CHASSIS VEHICLES																	
- TRUCK	-	-	-	-	-	-	1.1	-	-	0.1	0.3	-	10.8	18.6	9.9	52.1	5.7
- LORRY	-	-	-	-	33.9	-	0.2	3.1	0.2	9.9	14.4	0.1	14.3	26.9	1.4	0.6	3.7
TRACTOR DRIVEN VEHICLES																	
- HILO	-	-	17.4	0.5	-	-	7.8	1.0	2.8	5.4	5.1	20.2	10.2	3.5	-	0.4	4.9
- RIG	-	0.1	-	-	64.5	13.7	15.7	21.4	4.0	5.4	30.3	4.5	23.8	14.6	-	0.6	9.0
- INTERLINK	6.1	-	67.2	1.7	-	-	0.7	5.3	11.4	10.6	1.6	-	6.1	11.7	-	1.2	8.3

TABLE J

COMPARATIVE DATA OF REPORTING SA MILLS FROM 1925 ONWARDS

PERIOD (SEASON)	PERCENT CANE		CANE / SUGAR RATIO		EXTRACTION	POL % FIBRE IN BAGASSE	PERCENT BAGASSE		IMBIBITION PERCENT		MIXED JUICE		FINAL MOLASSES SUC/BRIX PURITY	BOILING HOUSE RECOVERY	OVERALL RECOVERY
	POL	FIBRE	TEL QUEL	96 POL SUGAR	POL BASED		POL	MOISTURE	CANE	FIBRE	PURITY POL BASED	REDUCING SUGAR/ POL RATIO	CHEM.SUC.	POL BASED	POL BASED
AVERAGE 1925 - 1934	13.19	15.78	9.86	9.64	89.83	8.86	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	7.05	3.11	51.60	32.6	213	86.01	3.22	43.3	88.36	81.34
AVERAGE 1945 - 1954	13.79	16.06	8.60	8.36	93.04	5.95	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	6.76	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	5.98	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	5.66	2.47	52.86	34.5	224	85.10	3.69	38.5	90.43	84.42
1958	13.12	15.92	9.09	8.82	92.87	5.89	2.55	52.38	32.9	207	84.46	4.3	39.1	89.49	83.11
1959	13.66	15.92	8.74	8.44	92.86	6.16	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	5.98	2.60	53.01	36.2	238	85.63	3.51	40.3	89.40	83.45
1961	13.75	14.52	8.51	8.26	94.21	5.50	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	5.02	2.24	52.17	41.2	266	85.36	3.11	39.6	87.81	82.67
1963	13.55	15.50	8.66	8.42	94.08	5.16	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	5.23	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	5.73	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	5.00	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	5.24	2.29	53.52	39.9	262	85.06	3.63	40.6	88.38	83.27
1967	12.92	15.01	9.28	9.06	94.15	5.04	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	4.51	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	4.30	1.89	53.30	41.2	274	84.25	4.17	38.3	88.26	84.13
1970	13.61	15.34	8.64	8.34	95.41	4.06	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	3.58	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	3.98	1.75	52.85	41.3	279	86.66	4.17	40.0	89.48	85.50
1973	13.08	15.64	8.93	8.62	95.55	3.87	1.69	53.19	45.0	288	85.66	4.70	39.2	89.13	85.17
1974	13.08	15.59	8.97	8.65	95.49	3.94	1.73	53.10	44.6	286	85.01	5.05	38.4	88.76	84.76
AVERAGE 1965 - 1974	13.16	15.22	8.95	8.68	95.00	4.35	1.91	53.15	41.7	274	84.80	4.15	39.3	88.49	84.06
1975	12.60	15.67	9.33	9.00	95.38	3.87	1.68	53.52	43.7	279	84.70	5.31	38.8	88.68	84.58
1976	12.43	15.52	9.41	9.08	95.48	3.79	1.66	53.20	41.7	281	84.47	5.58	38.2	88.99	84.97
1977	12.83	15.79	9.12	8.80	95.87	3.51	1.56	52.55	45.6	302	84.39	5.67	38.3	88.62	84.96
1978	12.64	15.22	9.07	8.77	96.63	2.95	1.35	51.59	45.4	314	85.36	5.27	38.0	89.58	86.55
1979	12.96	15.49	8.85	8.54	96.92	2.70	1.23	52.04	49.1	333	85.40	5.11	38.3	89.48	86.73
1980	13.34	15.95	8.73	8.42	96.89	2.73	1.24	52.10	52.2	344	84.80	5.25	38.7	88.17	85.42
1981 ONWARDS DATA ARE SUCROSE BASED	SUCROSE BASED				SUCROSE BASED						SUCROSE BASED	(GL+FR)/ SUC.RATIO	SUCROSE BASED	SUCROSE BASED	SUCROSE BASED
1981	12.30	16.13	9.50	9.18	97.02	2.38	1.10	51.57	52.4	341	85.67	6.94	37.1	87.75	85.14
1982	12.86	15.61	9.10	8.79	97.02	2.57	1.19	51.35	51.5	345	85.32	5.59	36.6	87.64	85.05
1983	12.33	16.15	9.74	9.40	97.02	2.37	1.08	52.68	55.0	356	84.20	5.69	38.2	85.37	82.83
1984	12.27	15.62	9.43	9.11	97.42	2.12	0.99	51.35	51.5	344	85.69	5.28	37.0	88.23	85.96
AVERAGE 1975 - 1984	12.66	15.71	9.23	8.91	96.57	2.90	1.31	52.20	48.8	324	84.98	5.57	37.9	88.25	85.22
1985	13.13	15.38	8.88	8.57	97.47	2.25	1.04	51.64	52.9	358	84.55	6.28	36.3	87.51	85.30
1986	12.80	15.24	9.08	8.76	97.66	2.05	0.95	51.27	54.3	368	82.44	5.44	36.7	87.70	85.62
1987	12.00	15.23	9.67	9.33	97.63	1.94	0.91	51.24	52.6	357	85.25	5.76	36.8	87.84	85.76
1988	12.61	15.44	9.16	8.83	97.60	2.04	0.96	50.82	53.0	355	85.70	5.43	36.8	88.33	86.27
1989	13.17	15.07	8.72	8.41	97.67	2.11	0.98	51.61	53.5	366	86.40	4.94	36.7	88.74	86.67
1990	12.91	15.14	8.92	8.60	97.75	1.98	0.92	51.62	54.1	368	86.23	5.00	37.0	88.50	86.51
1991	13.04	14.93	8.77	8.42	97.95	1.85	0.87	47.07	54.4	375	86.29	4.80	37.1	88.88	87.06
1992	13.82	15.40	8.57	8.23	97.81	1.79	0.93	51.92	58.1	387	83.61	6.49	37.4	85.92	84.05
1993	12.53	16.23	9.56	9.22	97.75	1.78	0.83	51.52	60.1	380	83.14	5.55	38.2	85.05	83.14
1994	12.54	15.49	9.37	9.00	97.87	1.77	0.83	51.27	55.1	366	83.66	6.14	36.9	86.50	84.66
AVERAGE 1985 - 1994	12.86	15.36	9.07	8.74	97.72	1.95	0.92	51.01	54.8	368	85.04	5.58	37.0	87.50	85.50