SEVENTY-EIGHTH ANNUAL REVIEW OF THE MILLING SEASON IN SOUTHERN AFRICA (2002-2003)

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Abstract

Performance, throughput and other relevant aspects of the sugar industries in southern Africa[1] are presented and discussed. Data from sugar mills in South Africa, Swaziland, Zimbabwe and Malawi are included. The cane crop and factory performance are discussed, with trends in RV receiving particular mention. The season was notable for the excellent cane quality throughout due to low summer rainfall. This resulted in the production of a record sugar tonnage in South Africa at a very good cane to sugar ratio. Mill performance was generally much improved over previous seasons as a result.

Keywords: milling review, sugar factory review, mill performance, cane quality

Cane Crop

Cane varieties
The varietal distribution in southern Africa for the 2002-2003 season (Table G) shows few significant changes from the previous season. At Malelane, the percentage of N25 continued to increase, while the percentage of NCo376 decreased at several mills, most noticeably at Umfolozi, Entumeni, Darnall and Hippo Valley. Reporting of varieties has improved slightly, with the percentage of unknown and 'other' varieties decreasing from 25,1 to 22,3%, with Sezela showing great improvement in this regard from 66,5 to 47,5%.

Burning
The percentage of cane burnt in South Africa decreased to 84,6% in the season under review, a level last seen in the 1995-1996 season. The mills that showed the largest decreases in percentage of burnt cane were Pongola, Noodsberg and Sezela, with Felixton, Maidstone and Gledhow also reporting less burnt cane. In particular, both Noodsberg and Sezela crushed 100% burnt cane in 2001-2002, but in 2002-2003 crushed 77,7 and 71,6% burnt cane, respectively.

Cane quality
The usual cane quality parameters for the past ten seasons for South Africa are shown in Figure 1. Both ERC % cane and ash % cane returned to the good values of the previous record 1999-2000 season, while the mixed juice purity rose to a record high value of 87,31%.

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[1]South African sugar factories: AK=Amatikulu, DL=Darnall, EN=Entumeni, ES=Eston, FX=Felixton, GH=Gledhow, KM=Komati, ML=Malelane, MS=Maidstone, ND=Noodsberg, PG=Pongola, SZ=Sezela, UC=Union Co-op, UF=Umfolozi, UK=Umzimkulu
Malawi sugar factories: DW=Dwangwa, NH=Sugar Corporation of Malawi, Nchalo
Swaziland sugar factories: MH=Mhlume, SM=Simunye, UR=Ubombo Ranches
Zambia sugar factories: NK=Nkambala
Zimbabwe sugar factories: HV=Hippo Valley, TR=Triangle

The monthly values of RV % cane are shown in Figure 2 for the past two seasons, from which the unusual nature of the season may be seen. This arose from the distribution of rainfall, with relatively little falling at the beginning and the end of the season, but some significant falls in winter (see Figure 3). The reasons for the resulting effect on cane quality are more fully discussed by Singels *et al* (2003) and will not be repeated here. Suffice it to say that the sustained good cane quality from June until the end of the season was the major factor in producing the record sugar tonnage.

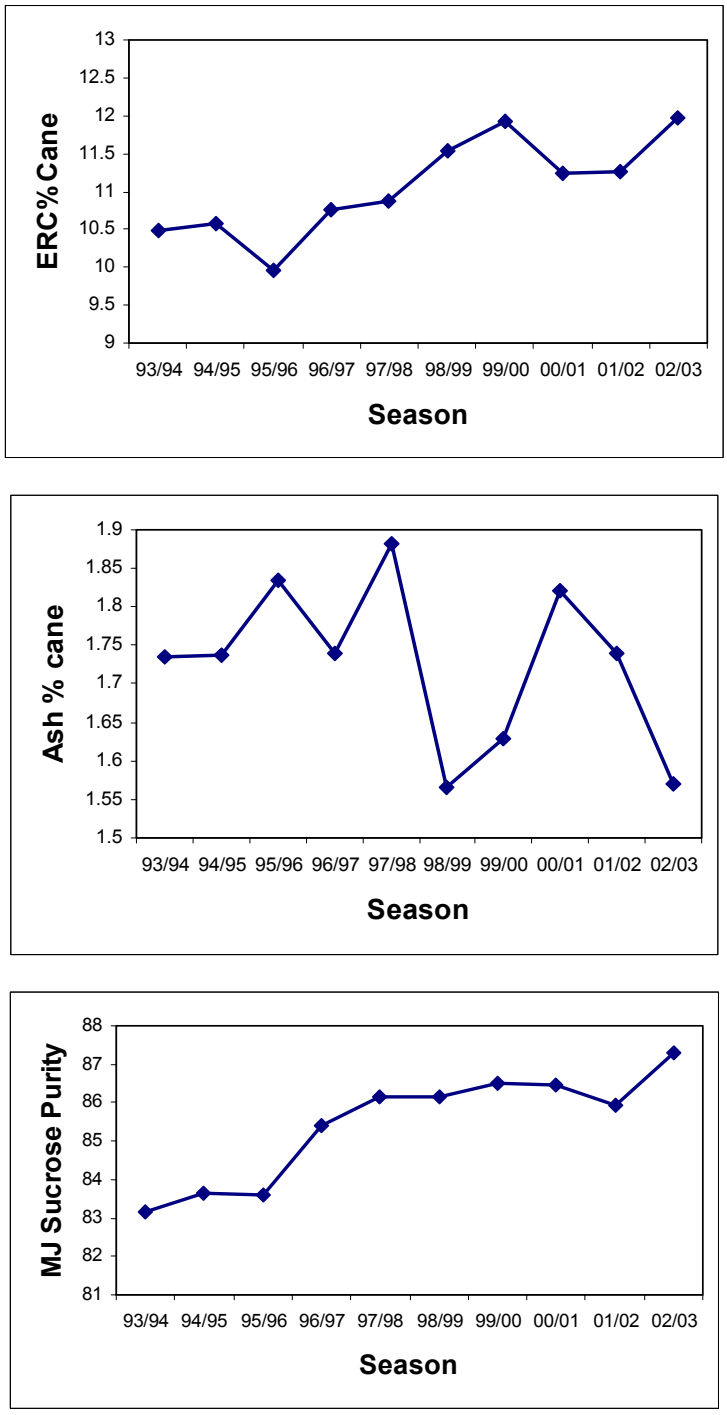

Figure 1. Cane quality trends in South Africa.

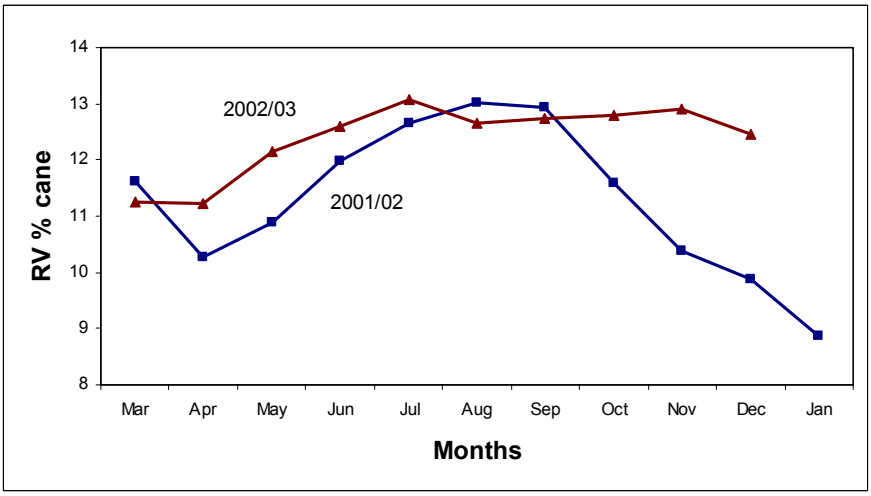

Figure 2. Monthly RV % cane in South Africa for the 2001-2002 and 2002-2003 seasons.

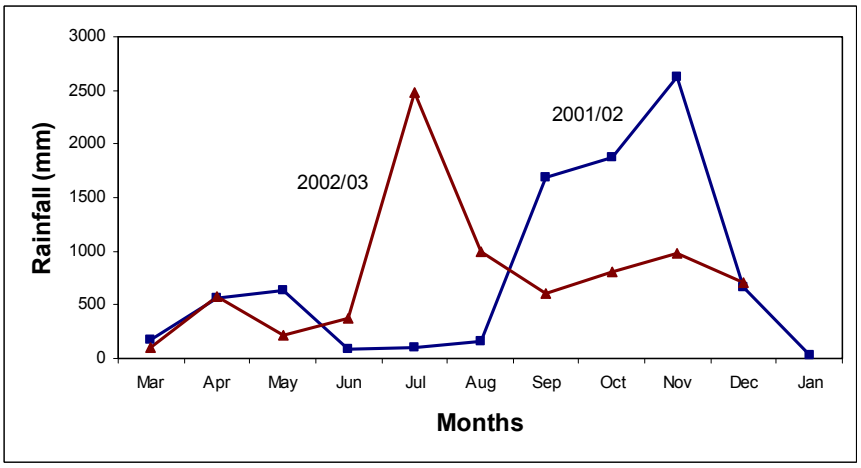

Figure 3. Rainfall in South Africa for the 2001-2002 and 2002-2003 seasons, calculated as the sum of the rainfalls recorded at all mills crushing for a particular month.

The trends in season average RV % cane for individual mills for the past two seasons (Figure 4) show that cane quality improved at all mills last season, with Malelane, Maidstone, Gledhow, Sezela and Umzimkulu showing an increase in RV % cane of at least 1%. The South African industry average RV % cane rose correspondingly from 11,80% in 2001-2002 to 12,55% in 2002-2003. The Swaziland industry encountered a similarly dry season, and the cane quality also improved significantly, from an average ERC % cane of 11,82% in 2001-2002 to 12,55% in 2002-2003.

The weekly trends in mixed juice quality are shown in Figure 5. The season started normally with high purities from mature cane in the Midlands, followed by a drop as other mills started crushing. The purity then peaked in mid-season with low reducing sugar contents, but unusually did not drop off significantly at the end of the season, despite crushing continuing well into December. The relative lack of vigorous cane growth is evident by the low reducing sugar contents until the end of the season (around 3% on Brix), whereas in a normal season this would rise to around 5-7% on Brix. Mixed juice ash levels were consistently below 4% on Brix for the entire season, and in fact declined slightly towards the end, the result of low ash in cane and steady operation.

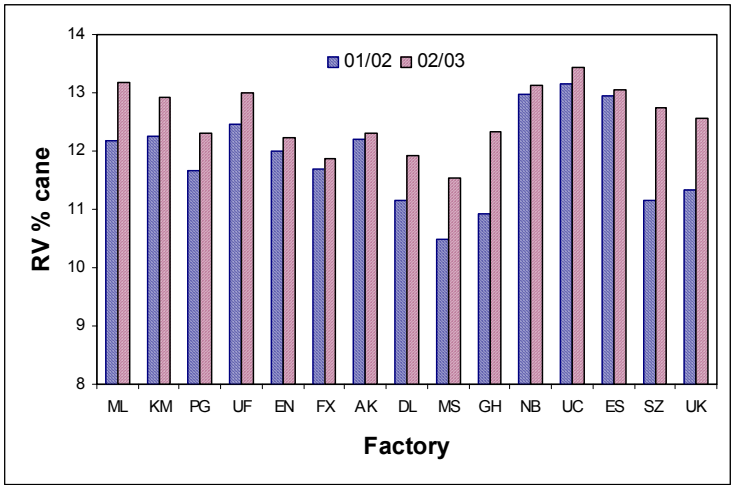

Figure 4. RV % cane for South African mills for the 2001-2002 and 2002-2003 seasons.

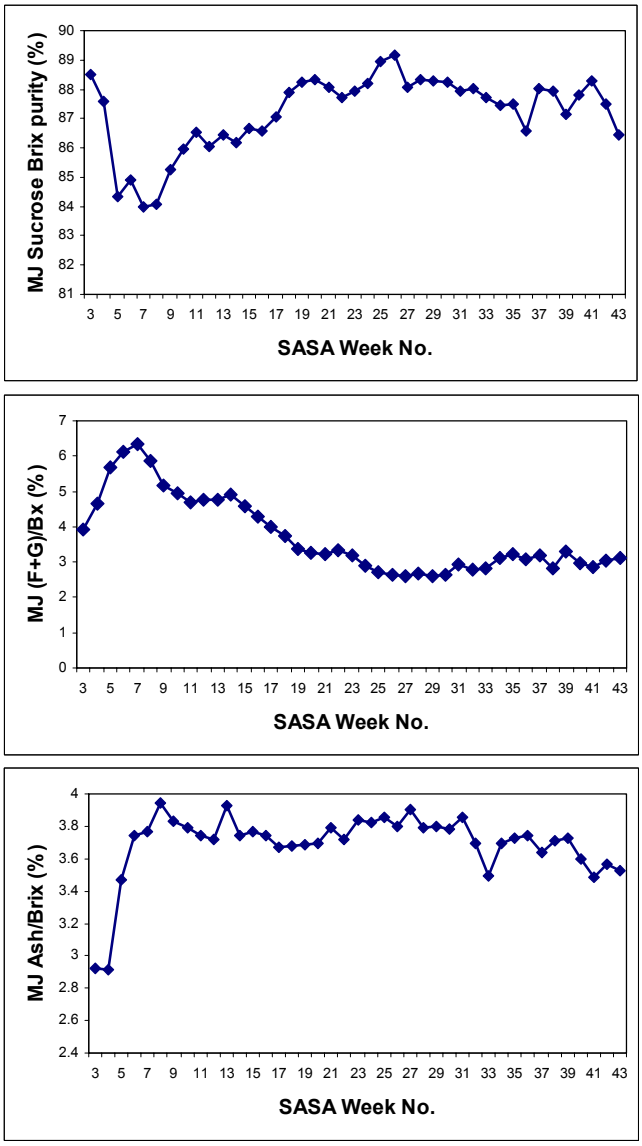

Figure 5. Weekly trends in mixed juice quality in South Africa for the 2002-2003 season.

Cane tonnage

The tonnages of cane processed over the past 10 seasons in South Africa are shown in Figure 6, while the tons cane per hour (tch) for the same period are shown in Figure 7. The tonnage processed in the 2002-2003 season (23 012 million tons) was higher than that processed in the previous season, but below that of the record 2000-2001 season. The monthly average throughputs for the industry for the past two seasons (Figure 8) show a better supply of cane in 2002-2003 towards the end, with most mills boiling-off in December. The dry season also led to a very low figure for no-cane stops of 6,41% for the industry, and it can be seen from Figure 9 that cane delivery was steady throughout the season, with only the heavy July rains causing significant delays. In the season under review, the industry was better able to schedule rateable delivery of cane, and hence the crush rates were steady throughout the season. It must also be remembered that the crush rates are quoted as tons cane processed per crushing hour, and exclude time lost for stops, hence the large percentages of no-cane stops in the previous two seasons did not affect the overall crush rates.

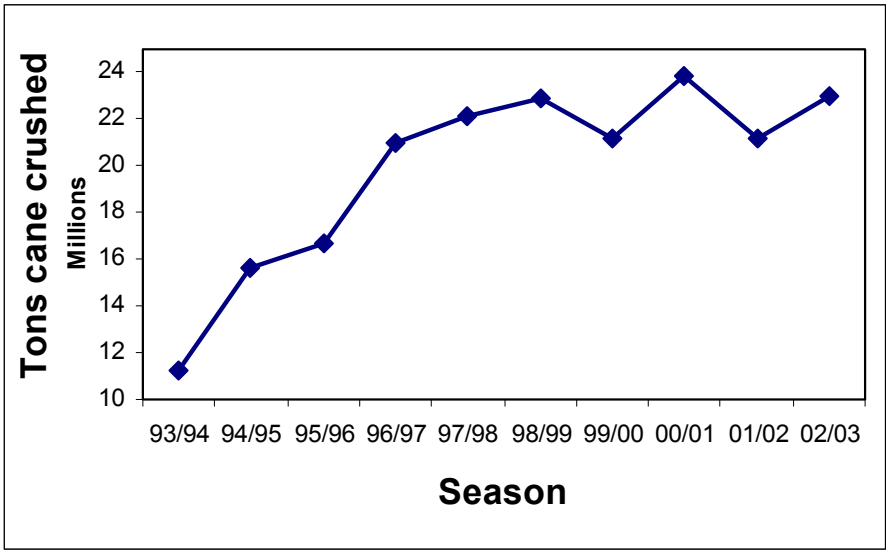

Figure 6. Cane tonnages in South Africa. (Drought years were 1992-1993 to 1995-1996.)

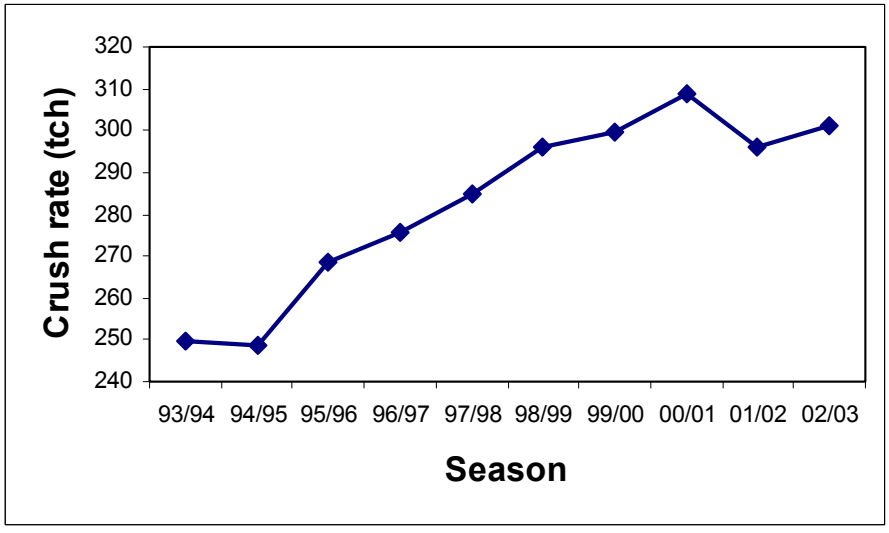

Figure 7. Average tons cane per hour (tch) crushed in South Africa.

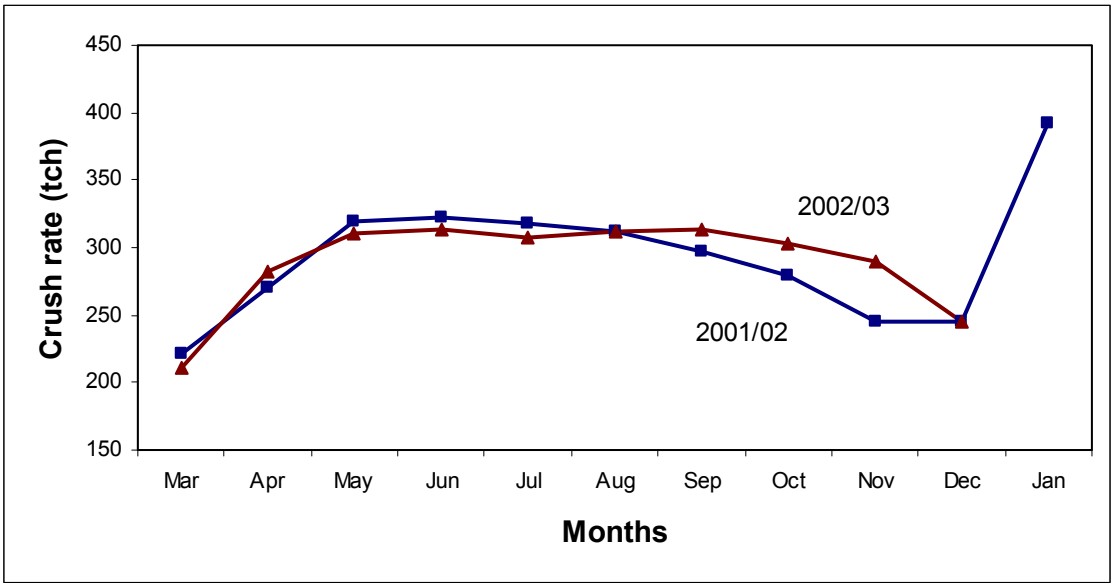

Figure 8. Monthly values of crushing rate (tch) in South Africa for the 2001-2002 and 2002-2003 seasons.

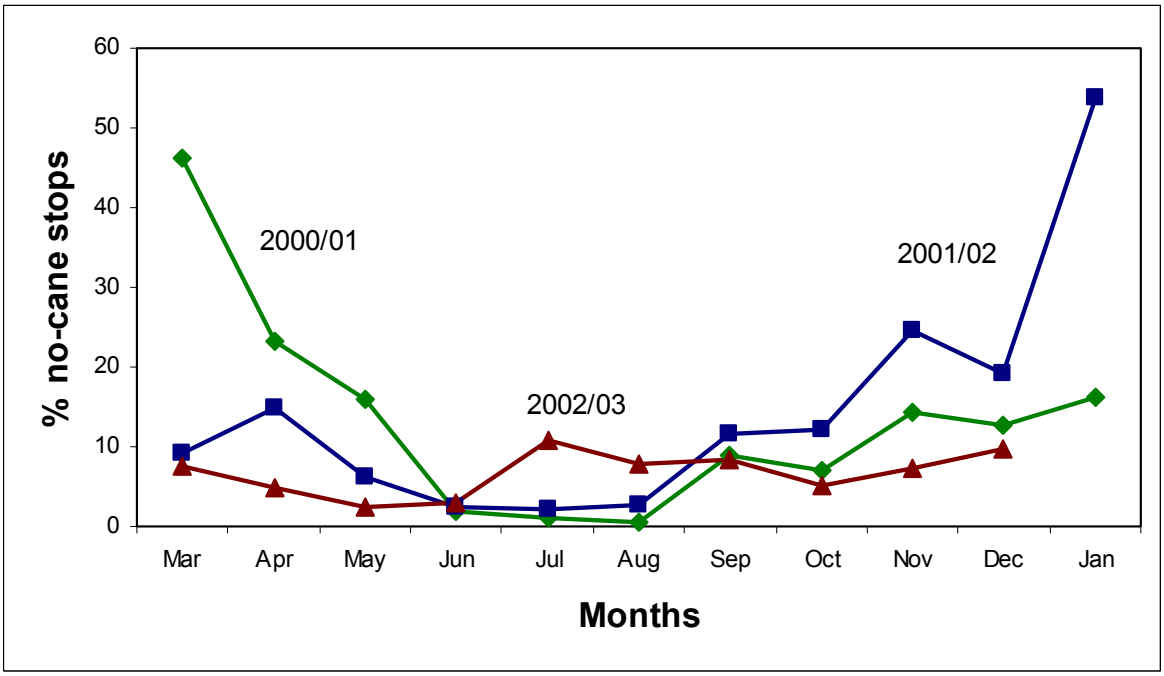

Figure 9. Monthly values of no-cane stops in South Africa for the 2000-2001, 2001-2002 and 2002-2003 seasons.

Cane to sugar ratio

A consequence of the excellent cane quality and the steady factory operation was a record cane-to-sugar ratio for the South African industry of 8,32, surpassing the previous best obtained in the good 1999-2000 season, as shown in Figure 10. Values of cane to sugar ratio for South Africa, Swaziland, Zimbabwe and Malawi are shown in Figure 11 for the past two seasons. It is clear that South Africa's neighbours have also benefited from a dry season in southern Africa, with the Swaziland industry achieving a highly commendable cane to sugar ratio for 2002-2003 of 7,92.

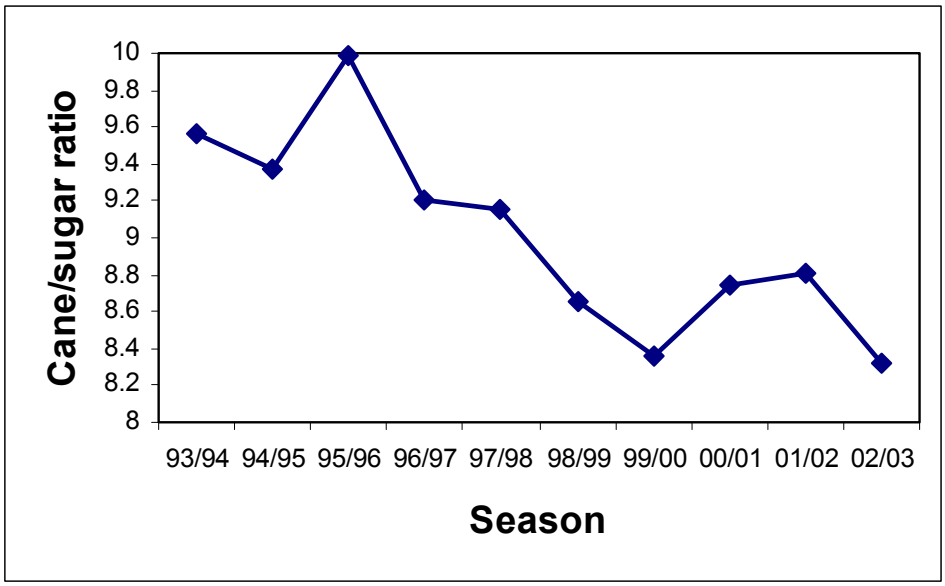

Figure 10. Cane to sugar ratio in South Africa for recent seasons.

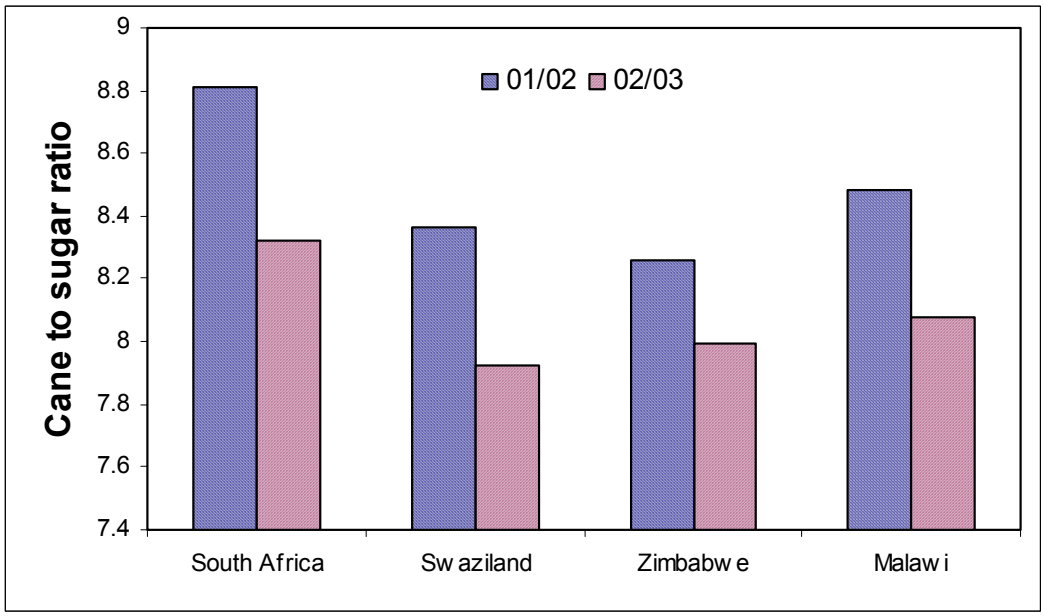

Figure 11. Cane to sugar ratio in Southern Africa for the 2002-2003 season.

Factory Performance

Length of the season

The South African season started on 14 March 2002 at Noodsberg and Union Co-op, and ended on 22 December 2002 at Sezela. The longest season was 282 days at Noodsberg while the shortest was 229 days at Felixton. The weighted average season length for the industry was 251 days, the same as in 2001-2002, with most mills closing in December.

Time efficiencies

The time accounts for this and the previous season in South Africa are shown in Table 1.

Table 1. Time account in South Africa.

	2001-2002	2002-2003
Overall time efficiency (%)	80,46	83,97
Scheduled stops (%)	5,34	5,27
Other stops (%)	4,55	3,82
No-cane stops (%)	9,23	6,41
Foreign matter stops (%)	0,41	0,53

Note the lower percentage of no-cane stops in 2002, as previously mentioned, and the resulting significantly higher OTE. The steadier operation of the mills in 2002-2003 and the improved time efficiency is more fully discussed by Singels *et al.* (2003). A comparison of length of milling season (LOMS) and overall time efficiencies (OTE) for southern African mills is shown in Figure 12.

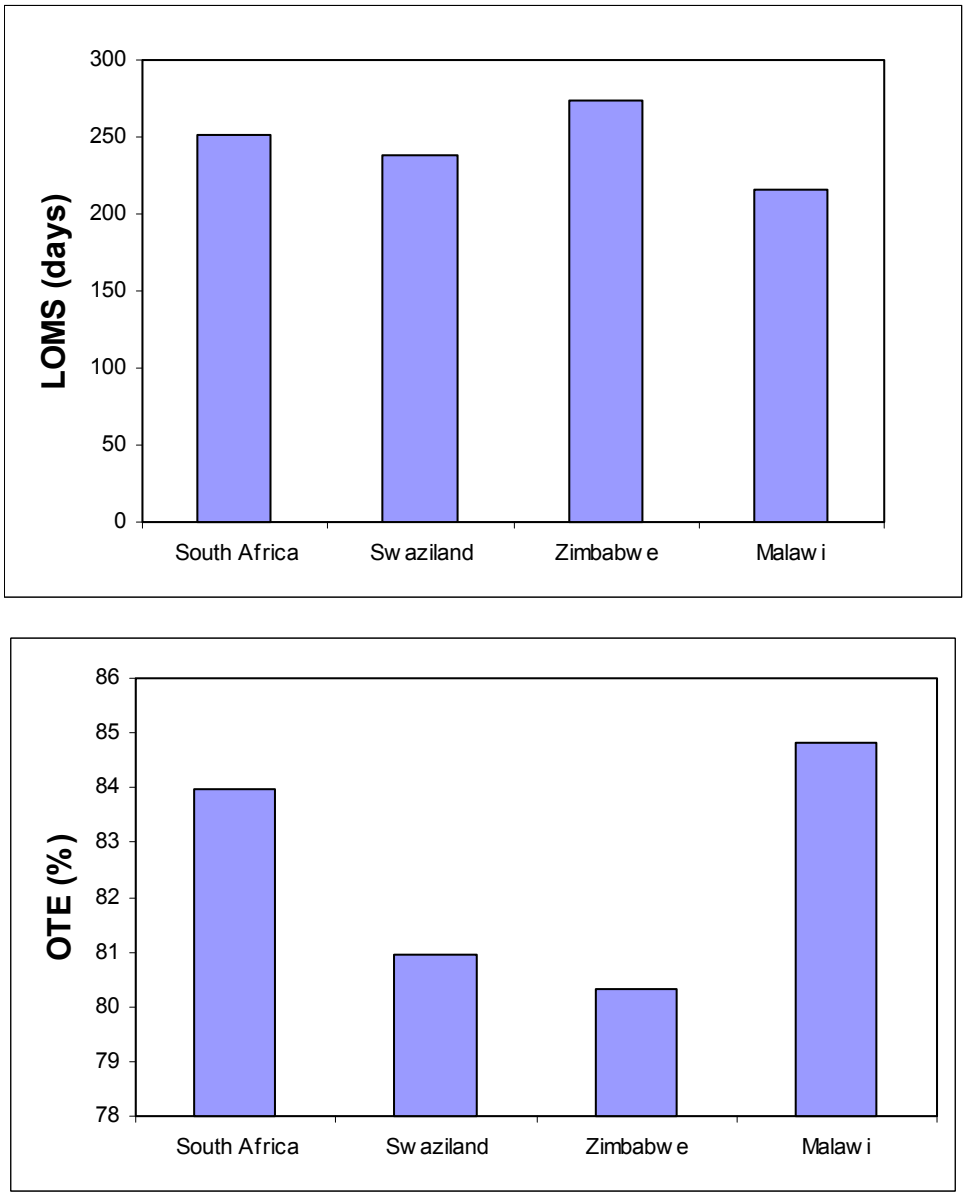

Figure 12. Average length of milling season (LOMS) and overall time efficiency (OTE) in southern Africa for the 2002-2003 season.

The lost time % available (LTA) figure has continued to decrease to an excellent figure of 4,3%, with the averages for the South African industry for the last five years being shown in Figure 13. Values of LTA for individual mills for the past three seasons are shown in Figure 14, in which it can be seen that great improvements were made at some mills (ML, KM and DL), while other mills (EN, MS, SZ and UK) have managed to maintain consistently low LTAs. In particular, Sezela recorded a highly commendable figure of only 1,28%.

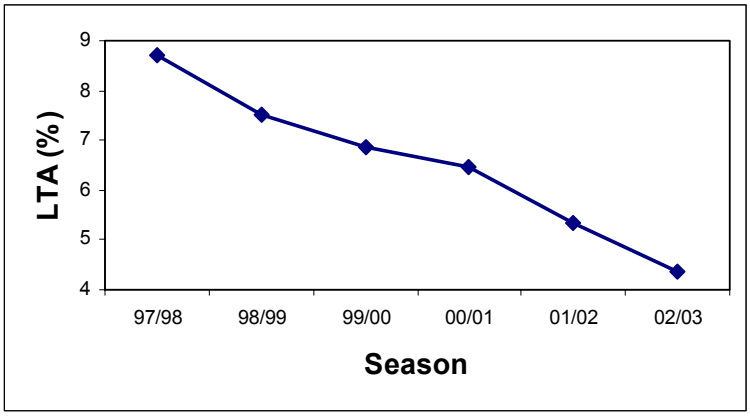

Figure 13. Lost time per cent available (LTA) in South Africa in recent seasons.

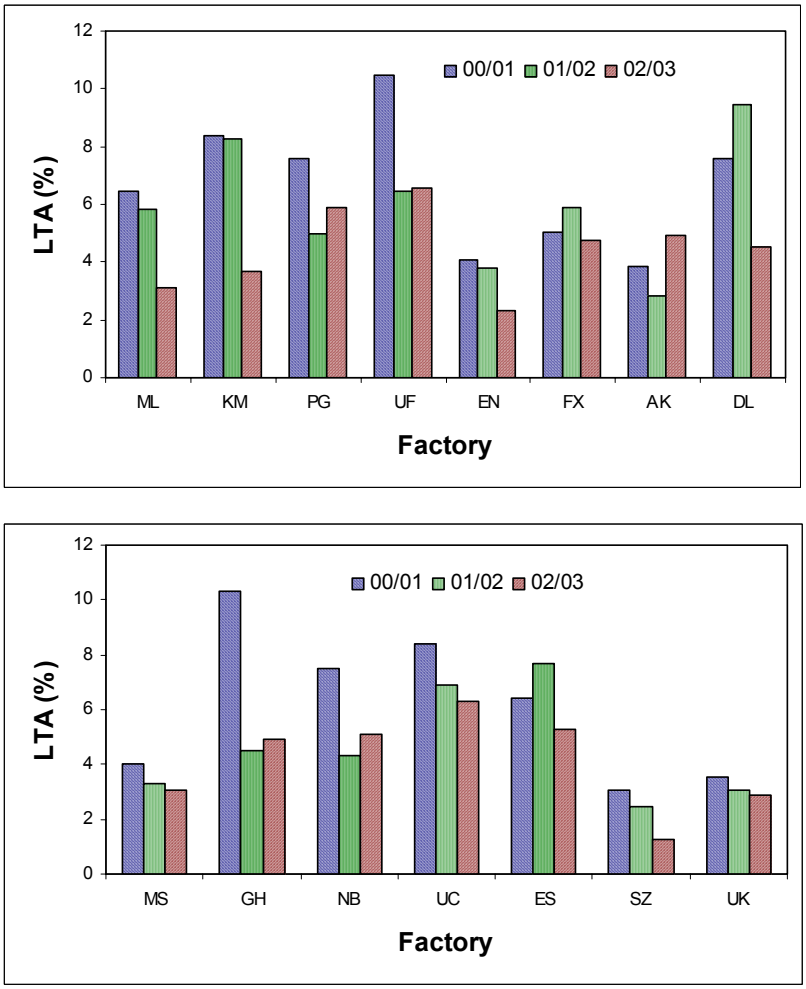

Figure 14. Lost Time Available (LTA) for South African mills in recent seasons.

Undetermined sucrose loss was again below the 2,0% benchmark, although a lower figure could have been expected with the steady operational conditions and low no-cane stops during 2002 (see Figure 15). Notable improvements were shown by Umfolozi (from 3,49 to 2,75%) and Entumeni (from 2,71 to 1,35%) while most other mills achieved similar figures to the previous season.

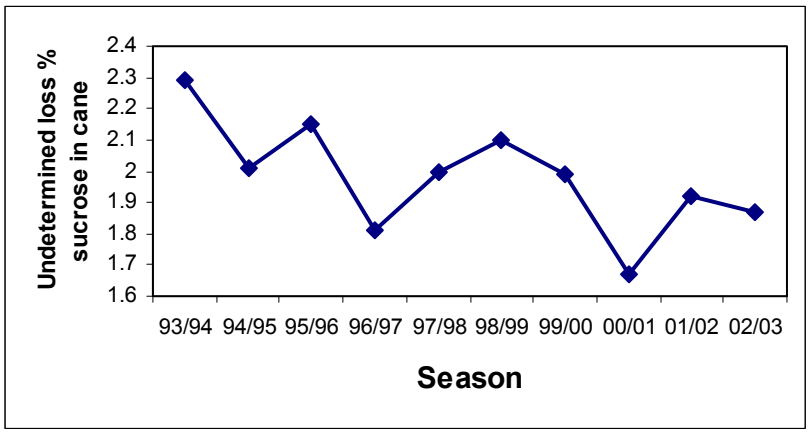

Figure 15. Undetermined loss in South Africa.

Extraction and clarification
As might be expected, extraction improved at most mills with the steady cane delivery characteristic of the 2002-2003 season and the generally lower fibre % cane values. Six mills (ML, KM, FX, AK, MS and UK) routed clarifier muds back to the diffusers for the entire 2002-2003 season. PG and ES did so at the start of the season, but reverted to mud filtration for most of the balance of the season.

Boiling house performance
All factories achieved good to excellent boiling house recoveries (BHR) for the season as a result of the outstanding cane quality and steady operation. The industry average BHR rose from 88,18% in 2001-2002 to 89,11% in 2002-2003, with EN, DL, MS, GH and SZ all improving by more than one unit (Figure 16). UC achieved an exceptional average of 91,76% for the season, which appears to be an all-time record for a full season's recovery figure. The target purity difference (TPD) values (molasses based) showed the usual parabolic trend, but at lower than usual values (Figure 17), with an industry average of 4,4 units. The unseasonal rains in late July caused a slight rise in the August TPD, but as the rains were largely confined to the north coast, the rise was small.

Molasses factor, the ratio of sucrose in molasses to non-sucrose in mixed juice, rose sharply in 2002-2003 above the values of the previous two seasons (Figure 18). This was unexpected, considering the good conditions of the season and that the factors that usually lead to a high molasses factor, namely molasses target purity difference, tons non-sucrose in mixed juice per hour and tons of molasses at 85^{o}Bx percent cane, all dropped in 2002-2003. The reason for this is probably the relative sucrose and non-sucrose loadings in the boiling house, coupled with the lowest reducing sugar/ash ratio in molasses in the past nine seasons. Figure 19 shows the trends of tons of sucrose in mixed juice per hour and tons of non-sucrose in mixed juice per hour in recent years for the South African industry, and it is clear that, while the sucrose loading was at a record high level, the non-sucrose loading was at its lowest level for the past five years. A higher molasses factor thus resulted in 2002-2003. By contrast, the high molasses factor in 1999-2000 was the result of high sucrose and non-sucrose loadings leading to very poor C-massecuite exhaustions, and hence high sucrose losses to molasses.

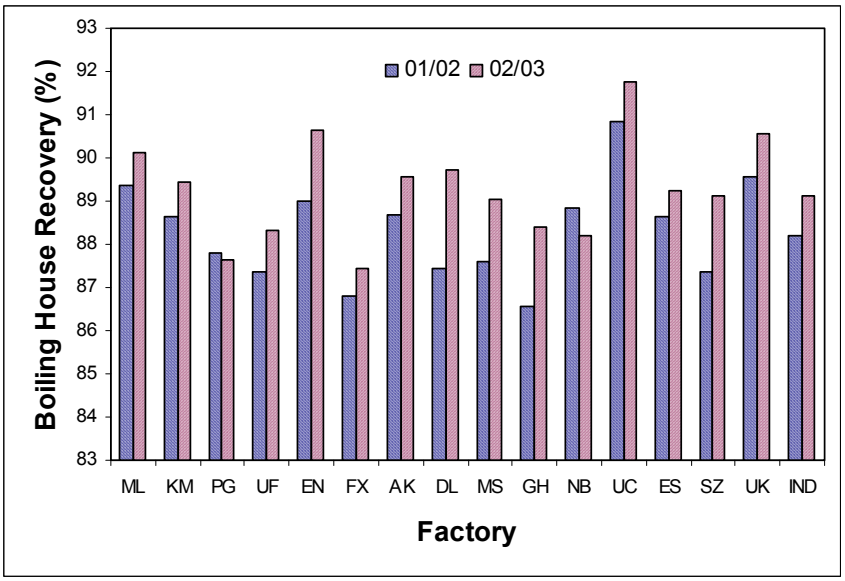

Figure 16. Boiling House Recoveries (BHR) for South African mills for the 2001-2002 and 2002-2003 seasons.

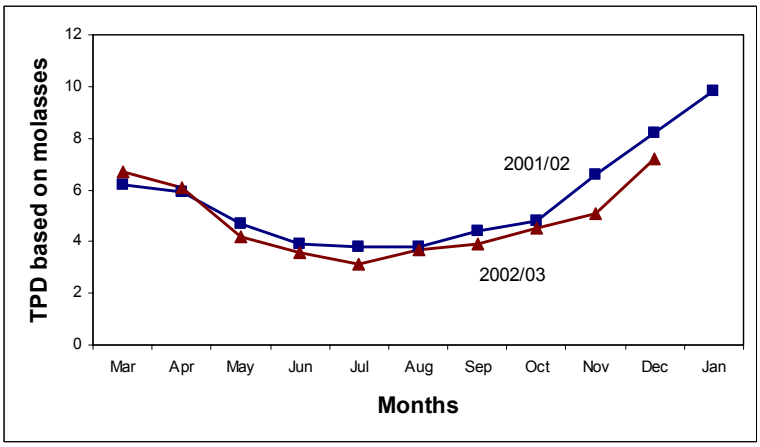

Figure 17. Monthly values of Target Purity Difference (TPD) (molasses based) in South Africa for the 2001-2002 and 2002-2003 seasons.

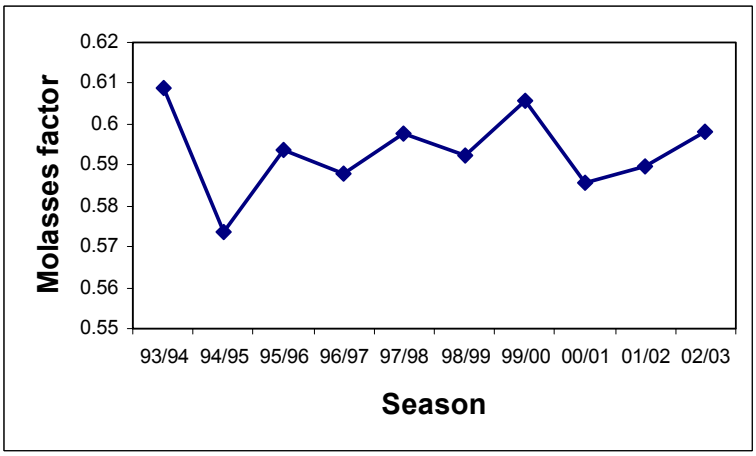

Figure 18. Molasses factor in South Africa.

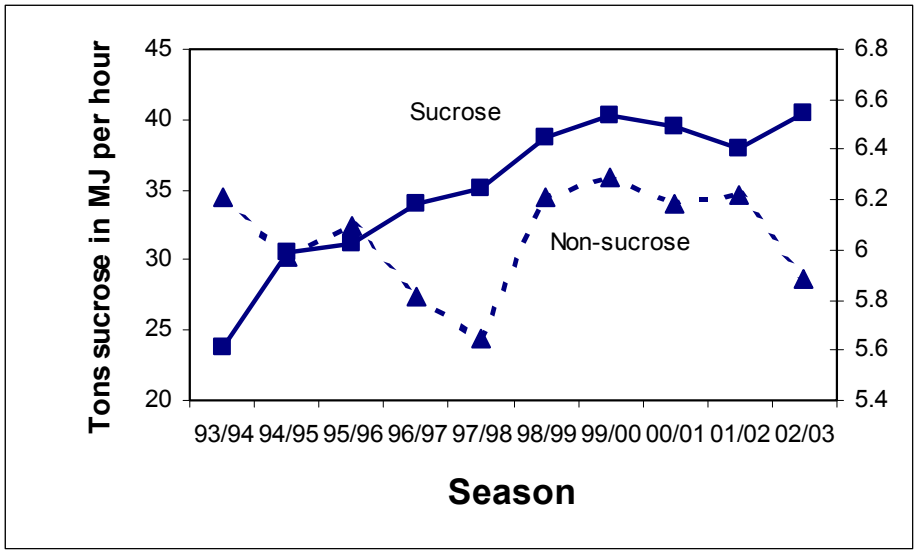

Figure 19. Mixed juice sucrose and non-sucrose loadings in South Africa.

Sugar quality

The trends in the quality of VHP sugar quality with respect to colour are shown in Figure 20, from which it can be seen that the colours have returned to the values produced in the late 1990s, down from the higher values from the 2001-2002 season. The higher average colours in the 2001-2002 season arose largely from very high colours towards the end of the season, which did not occur in 2002-2003 because of the cane quality and operational factors previously discussed.

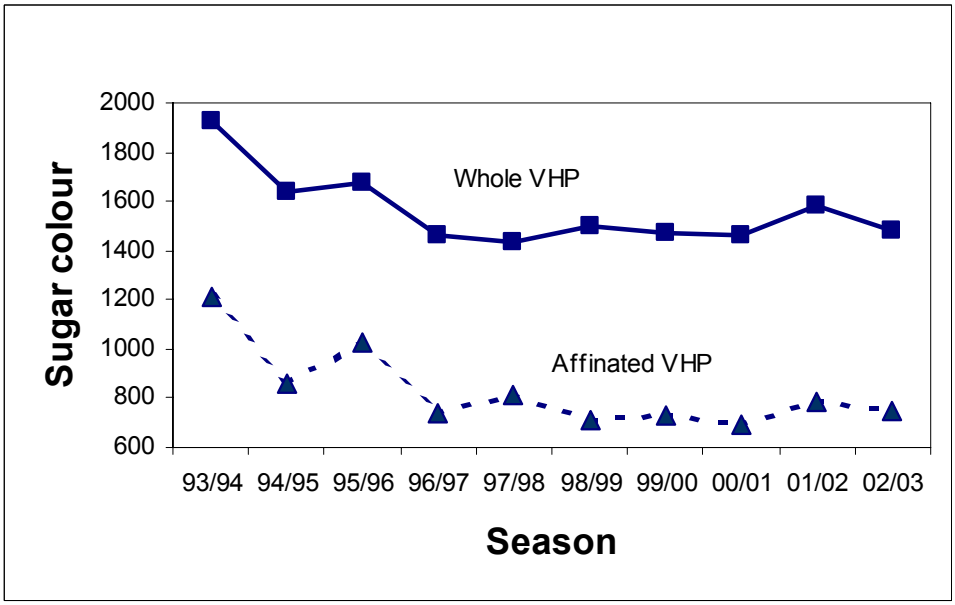

Figure 20. Very High Pol (VHP) and affinated sugar colours in South Africa.

Conclusions

The 2002-2003 season was an excellent one in South Africa and Swaziland, with a record sugar tonnage of good quality produced. The climatic conditions were favourable for sustained cane quality and steady factory operation, and most mills appear to have taken advantage of this.

Acknowledgements

The following people and organisations are thanked for their valuable contributions:
Mr M Achary for data analysis and preparation of graphs; SA Sugar Association Cane Testing Service, SA Sugar Terminals and Mill Laboratories for information and data, and the Sugar Milling Research Institute laboratory and other staff for their inputs.

REFERENCE

Singels A, Davis SB and Lionnet GRE (2003). The exceptional 2002-2003 season: why did it happen? *Proc S Afr Sug Technol Ass* 77 (in press).

Table B1 (Part 1). Cane crushed and sugar made, cane composition, throughputs and time accounts, performances and losses South African mills (season 2002-2003).

SYMBOLS OF FACTORIES	ML*	KM-A*	KM-B*	KM-AVE	PG*	UF*	EN**	FX-A*	FX-B*	FX-AVE	AK*	DL	MS-A*	MS-B*	MS-AVE
TONS SUGAR MADE AND ESTIMATED	237065	-	-	257529	162736	154286	48432	-	-	247507	199071	158215	-	-	215401
Refined % total sugar	-	-	-	-	71.54	65.31	-	-	-	-	-	-	-	-	-
Moisture all sugar	0.08	-	-	0.08	0.04	0.10	0.06	-	-	0.09	0.12	0.09	-	-	0.10
Pol all sugar	99.32	-	-	99.36	99.79	99.79	99.46	-	-	99.43	99.45	99.36	-	-	99.45
Tons cane crushed total	1853104			2056787	1409293	1262294	409394			2175081	1672146	1373582			1899923
Tons cane crushed per tandem		997097	1059690					1108826	1066255				849481	1050442	
Season started on	37348	-	-	37350	37334	37358	37362	-	-	37364	37363	37357	-	-	37355
Season completed on	37591	-	-	37584	37610	37606	37606	-	-	37593	37609	37593	-	-	37595
Length of season (days)	243	-	-	234	276	248	244	-	-	229	246	236	-	-	240
TIME ACCOUNT															
Overall time efficiency %	91.64	88.65	87.36	88.01	84.18	82.27	78.38	79.36	76.47	77.92	81.00	78.96	86.49	88.77	87.63
Scheduled stops % gross available time	0.19	4.72	4.17	4.45	4.60	3.09	8.31	7.05	8.00	7.52	7.71	7.80	3.85	4.12	3.99
Lack of cane % gross available time	5.15	2.34	4.31	3.33	3.99	8.22	11.28	9.32	8.33	8.83	6.73	9.07	6.37	4.51	5.44
Other stops % gross available time	2.94	3.62	3.09	3.36	5.28	5.78	1.88	3.16	4.60	3.88	4.18	3.73	3.14	2.39	2.76
Foreign matter % gross available time	0.08	0.66	1.07	0.86	1.94	0.63	0.15	1.11	2.60	1.85	0.39	0.43	0.16	0.20	0.18
Lost time % available crushing time	3.11	3.93	3.41	3.67	5.90	6.57	2.34	3.83	5.68	4.74	4.91	4.51	3.50	2.62	3.06
Force majeure stops (hours)	3.21	73.88	85.60	79.74	25.33	12.72	0.00	0.00	0.00	0.00	0.30	2.42	0.00	0.00	0.00

Table B1 (Part 1). continued

THROUGHPUTS PER CRUSHING HOUR															
Tons cane	342.76	202.39	218.87	421.11	253.92	260.72	89.01	255.72	255.27	511.00	346.21	307.53	171.47	207.16	379.05
Tons fibre	49.05	26.84	28.94	55.76	34.28	35.39	12.57	39.49	39.73	79.22	53.17	45.83	26.18	31.74	57.99
Tons brix in mixed juice	55.44	32.62	34.94	67.54	38.77	41.08	13.08	38.69	38.46	77.16	52.58	45.01	25.50	30.49	56.04
Tons sucrose in mixed juice	48.31	28.27	30.31	58.58	33.39	36.00	11.55	33.23	32.87	66.10	45.77	39.22	21.90	26.06	47.95
Tons non-sucrose in mixed juice	7.13	4.35	4.63	8.98	5.38	5.08	1.53	5.46	5.59	11.05	6.81	5.79	3.60	4.43	8.04
Tons of sugar produced	43.85	-	-	52.73	29.32	31.87	10.53	-	-	58.15	41.22	35.42	-	-	42.97
COMPOSITION OF CANE CRUSHED															
Sucrose % cane	14.36	14.18	14.07	14.12	13.51	14.13	13.30	13.22	13.12	13.17	13.49	13.11	12.94	12.77	12.85
Pol % cane	14.20	14.01	13.92	13.96	13.36	14.01	13.18	13.11	13.02	13.06	13.38	12.95	12.79	12.64	12.71
Fibre % cane	14.31	13.26	13.22	13.24	13.50	14.17	15.23	15.44	15.56	15.50	15.36	16.00	15.27	15.32	15.30
Brix % cane	16.72	16.59	16.45	16.52	15.89	16.36	15.28	15.76	15.73	15.75	15.75	15.33	15.45	15.42	15.43
Ash % cane	1.56	1.87	1.87	1.87	1.57	1.83	1.96	1.69	1.67	1.68	1.14	1.64	1.24	1.23	1.23
ERC % cane	12.57	12.38	12.28	12.33	11.73	12.41	11.71	11.33	11.19	11.26	11.74	11.37	11.08	10.83	10.94
ERC % sucrose in cane	87.49	87.29	87.31	87.30	86.84	87.82	88.05	85.69	85.29	85.49	87.03	86.75	85.59	84.80	85.15
RV % cane	13.17	12.98	12.88	12.93	12.32	12.99	12.24	11.94	11.80	11.87	12.31	11.93	11.67	11.44	11.54

*Cane diffuser **Bagasse diffuser

Table B1 (Part 1). continued

SYMBOLS OF FACTORIES	ML*	KM-A*	KM-B*	KM-AVE	PG*	UF*	EN**	FX-A*	FX-B*	FX-AVE	AK*	DL	MS-A*	MS-B*	MS-AVE
EXTRACTION															
Extraction (sucrose based)	98.14	98.51	98.47	98.49	97.31	97.71	97.55	98.27	98.15	98.21	98.00	97.30	98.66	98.51	98.58
Corrected reduced extraction	97.83	98.12	98.07	98.09	96.77	97.21	97.26	98.24	98.15	98.20	97.93	97.20	98.64	98.50	98.57
Imbibition % fibre	391	372	319	345	305	378	369	365	366	365	371	337	389	408	400
Preparation index	93	93	92	92	91	-	91	92	90	91	92	91	91	90	90
Pol factor	99.57	99.97	98.97	99.45	99.07	99.15	99.17	98.87	98.69	98.78	99.03	99.56	99.84	99.97	99.91
Brix factor	101.08	101.19	100.00	100.58	100.77	100.65	100.19	100.94	100.92	100.93	100.65	100.76	101.71	102.49	102.14
RECOVERIES															
Boiling house recovery (sucrose)	90.14	-	-	89.46	87.63	88.33	90.66	-	-	87.45	89.55	89.74	-	-	89.03
C. R. B.	87.28	-	-	87.51	86.13	86.52	87.37	-	-	86.54	87.62	87.25	-	-	87.91
Overall recovery (sucrose)	88.47	-	-	88.10	85.28	86.31	88.44	-	-	85.89	87.76	87.32	-	-	87.77
Ton cane per ton sugar	7.82	-	-	7.99	8.66	8.18	8.45	-	-	8.79	8.40	8.68	-	-	8.82
Ton cane per ton 96 pol sugar	7.56	-	-	7.72	8.33	7.87	8.16	-	-	8.48	8.11	8.39	-	-	8.51
Value Recovery %	100.71	-	-	100.54	98.91	98.85	100.20	-	-	100.20	100.71	100.22	-	-	102.40
BALANCES															
Sucrose lost % sucrose in cane															
- lost in bagasse (a)	1.86	-	-	1.51	2.69	2.29	2.45	-	-	1.79	2.00	2.70	-	-	1.42
- lost in filter cake (b)	-	-	-	-	0.17	0.52	0.19	-	-	-	-	0.48	-	-	-
- lost in final molasses (c)	8.35	-	-	8.78	9.58	8.13	7.57	-	-	10.32	9.00	7.80	-	-	9.04
- undetermined losses (d)	1.32	-	-	1.61	2.28	2.75	1.35	-	-	2.01	1.24	1.71	-	-	1.77
Non-sucrose ratio	1.04	-	-	1.01	1.06	1.06	1.07	-	-	1.06	1.09	1.07	-	-	1.02
Fructose ratio FM/MJ	0.96	-	-	0.90	0.89	0.97	0.94	-	-	0.95	0.97	0.95	-	-	0.88
Glucose ratio FM/MJ	0.77	-	-	0.58	0.65	0.70	0.73	-	-	0.65	0.70	0.76	-	-	0.70

*Cane diffuser **Bagasse diffuser

Table B1 (Part 2). Cane crushed and sugar made, cane composition, throughputs and time accounts, performances and losses South African mills (season 2002-2003.)

SYMBOLS OF FACTORIES	GH-A*	GH-B	GH-AVE	NB	UC*	ES*	SZ-A*	SZ-B*	SZ-AVE	UK*	INDUSTRY
TONS SUGAR MADE AND ESTIMATED	-	-	161303	203375	104450	174880	-	-	283436	159260	2766946
Refined % total sugar	-	-	99.77	100.00	-	-	-	-	-	-	-
Moisture all sugar	-	-	0.02	0.02	0.08	0.10	-	-	0.08	0.07	0.08
Pol all sugar	-	-	99.93	99.93	99.51	99.46	-	-	99.52	99.52	99.54
Tons cane crushed total			1383225	1673982	804492	1418128			2321365	1299759	23012555
Tons cane crushed per tandem	470329	912896					1133179	1188186			
Season started on	-	-	37364	37329	37329	37334	-	-	37354	37355	37329
Season completed on	-	-	37609	37611	37610	37611	-	-	37612	37611	37612
Length of season (days)	-	-	245	282	281	277	-	-	258	256	251
TIME ACCOUNT											
Overall time efficiency %	83.19	87.57	85.39	83.27	84.25	84.94	87.70	90.24	88.98	82.28	83.97
Scheduled stops% gross available time	4.15	5.12	4.64	4.30	7.63	3.63	4.13	4.40	4.27	7.10	5.27
Lack of cane % gross available time	6.85	3.46	5.15	7.46	2.39	6.55	6.73	3.80	5.26	8.05	6.41
Other stops % gross available time	5.19	3.68	4.43	4.50	5.66	4.75	1.20	1.11	1.16	2.44	3.82
Foreign matter % gross available time	0.61	0.17	0.39	0.48	0.07	0.14	0.25	0.44	0.34	0.14	0.53
Lost time % available crushing time	5.88	4.03	4.94	5.12	6.30	5.30	1.35	1.22	1.28	2.87	4.35
Force majeure stops (hours)	0.00	0.00	0.00	0.00	0.00	9.00	0.00	0.00	0.00	0.00	132.72
THROUGHPUTS PER CRUSHING HOUR											
Tons cane	96.59	177.41	276.23	297.10	141.31	251.21	210.48	212.94	423.47	257.21	301.36
Tons fibre	14.14	25.73	40.19	39.10	18.82	37.04	33.74	33.90	67.64	38.39	43.85
Tons brix in mixed juice	14.74	26.56	41.63	45.92	22.22	38.92	32.42	33.13	65.57	39.37	46.36
Tons sucrose in mixed juice	12.84	23.29	36.13	40.90	19.90	34.52	28.58	29.16	57.74	86.90	40.48
Tons non-suc. in mixed juice	1.90	3.27	5.21	5.02	2.32	4.39	3.85	3.97	7.82	4.73	5.88
Tons of sugar produced	-	-	32.21	36.09	18.35	30.98	-	-	51.71	63.03	36.23
COMPOSITION OF CANE CRUSHED											
Sucrose % cane	13.52	13.44	13.47	14.15	14.42	14.10	13.82	13.94	13.88	13.70	13.71
Pol % cane	13.37	13.31	13.33	13.99	14.29	14.00	13.71	13.82	13.77	13.61	13.58
Fibre % cane	14.93	15.45	15.28	14.11	13.44	14.74	16.16	16.06	16.11	14.93	14.80
Brix % cane	15.72	15.58	15.63	16.08	16.29	16.09	15.88	16.05	15.97	15.85	15.96
Ash % cane	1.46	1.39	1.41	1.75	1.08	1.87	0.00	0.00	0.00	1.49	1.57
ERC % cane	11.81	11.76	11.77	12.58	12.90	12.49	12.15	12.24	12.20	12.01	11.97
ERC % sucrose in cane	87.35	87.45	87.41	88.94	89.43	88.61	87.94	87.84	87.89	87.66	87.32
RV % cane	12.37	12.31	12.33	13.12	13.43	13.04	12.70	12.80	12.75	12.57	12.55

*Cane diffuser

Table B1 (Part 2). continued

SYMBOLS OF FACTORIES	GH-A*	GH-B	GH-AVE	NB	UC*	ES*	SZ-A*	SZ-B*	SZ-AVE	UK *	INDUSTRY
EXTRACTION											
Extraction (sucrose based)	98.30	97.66	97.87	97.31	97.65	97.48	98.24	98.28	98.26	98.32	97.96
Corrected reduced extraction	98.14	97.44	97.68	96.62	97.01	97.19	98.25	98.27	98.26	98.19	97.73
Imbibition % fibre	329	328	328	276	310	423	387	388	387	454	366
Preparation index	91	90	90	91	93	91	90	90	90	92	91
Pol factor	99.59	99.33	99.42	98.51	99.06	99.64	99.51	100.03	99.77	99.00	99.30
Brix factor	100.55	99.99	100.18	99.88	100.46	100.76	100.69	101.53	101.12	100.74	100.80
RECOVERIES											
Boiling house recovery (sucrose)	-	-	88.40	88.19	91.76	89.25	-	-	89.11	90.54	89.11
C. R. B.	-	-	86.46	84.61	87.05	85.31	-	-	86.05	87.92	86.75
Overall recovery (sucrose)	-	-	86.52	85.83	89.60	87.00	-	-	87.56	89.02	87.29
Ton cane per ton sugar	-	-	8.58	8.23	7.70	8.11	-	-	8.19	8.16	8.32
Ton cane per ton 96 pol sugar	-	-	8.24	7.91	7.43	7.83	-	-	7.90	7.87	8.02
Value Recovery %	-	-	99.80	97.51	99.89	98.15	-	-	99.58	101.19	100.01
BALANCES											
Sucrose lost % suc.in cane											
- lost in bagasse (a)	-	-	2.13	2.69	2.35	2.52	-	-	1.74	1.68	2.04
- lost in filter cake (b)	-	-	0.24	0.99	0.08	0.11	-	-	0.10	-	0.18
- lost in final molasses (c)	-	-	8.61	7.90	6.46	8.32	-	-	8.75	8.06	8.62
- undetermined losses (d)	-	-	2.50	2.60	1.51	2.05	-	-	1.85	1.24	1.87
Non-sucrose ratio	-	-	1.03	1.07	1.00	1.04	-	-	1.04	1.01	1.04
Fructose ratio FM/MJ	-	-	0.93	0.98	0.80	0.95	-	-	1.01	1.01	0.94
Glucose ratio FM/MJ	-	-	0.66	0.68	0.44	0.65	-	-	0.75	0.79	0.68

*Cane diffuser

Table B2. Cane crushed and sugar made, cane composition, throughputs and time accounts, performances and losses Swaziland, Malawi and Zimbabwe mills (season 2002-2003).

SYMBOLS OF FACTORIES	MH-A*	MH-B	MH-AVE	UB-A*	UB-B	UB-AVE	SM	NH*	DW*	HV-A*	HV-B*	HV-AVE	TR-A*	TR-B	TR-AVE
TONS SUGAR MADE AND ESTIMATED	-	-	147321	-	-	215069	220629	160359	100082	-	-	284109	-	-	295889
Refined % total sugar	-	-	57.83	-	-	42.83	0.00	31.36	42.81	-	-	13.50	-	-	20.56
Moisture all sugar	-	-	0.08	-	-	0.11	0.11	0.13	0.08	-	-	0.20	-	-	0.28
Pol all sugar	-	-	99.65	-	-	99.41	99.19	99.18	99.50	-	-	99.02	-	-	98.83
Tons cane crushed total			1105960			1793362	1709611	1343516	754568			2320200			2314187
Tons cane crushed per tandem	471965	633995		1020810	772552					1161072	1159128		1654629	659558	
Season started on	-	-	37367	-	-	37349	37354	37382	37374	-	-	37353	-	-	37350
Season completed on	-	-	37587	-	-	37605	37584	37595	37596	-	-	37606	-	-	37645
Number of crushing days	-	-	220	-	-	256	230	213	222	-	-	253	-	-	295
TIME ACCOUNT															
Overall time efficiency %	66.92	82.44	74.68	82.55	84.11	83.33	82.52	85.25	84.07	87.98	88.54	88.26	83.18	60.59	72.40
Sched.stops% gross avail.time	5.17	4.58	4.87	3.03	3.32	3.18	6.13	5.20	6.75	2.64	2.88	2.76	4.04	5.77	4.87
Lack of cane % gross " "	3.60	0.27	1.94	7.22	7.42	7.32	3.39	3.41	0.83	0.44	0.43	0.44	2.17	23.10	12.16
Other stops % gross " "	24.03	12.63	18.33	6.41	4.78	5.59	7.65	6.06	8.34	8.43	7.97	8.20	10.59	10.37	10.48
Foreign mat. % gross " "	0.27	0.08	0.18	0.79	0.38	0.59	0.30	0.09	0.01	0.51	0.17	0.34	0.03	0.17	0.09
Lost time % avail.crush.time	26.42	13.28	19.71	7.21	5.37	6.29	8.49	6.63	9.03	8.74	8.26	8.50	11.29	14.61	12.65
Force majeure stops (hours)	0.00	0.00	0.00	37.00	37.21	37.11	0.00	2.88	0.00	0.00	0.00	0.00	0.00	0.00	0.00
THROUGHPUTS PER CRUSHING HOUR															
Tons cane	134.18	146.32	281.75	203.39	151.78	354.80	383.01	300.13	179.58	217.58	215.93	433.50	281.38	168.66	472.72
Tons fibre	19.72	21.81	41.74	24.79	19.42	44.18	44.50	42.09	26.72	30.76	30.47	61.23	39.86	22.28	65.67
Tons brix in mixed juice	22.04	24.59	46.90	31.16	26.05	57.17	61.96	47.21	30.38	34.22	35.28	69.51	46.22	27.07	77.14
Tons pol in mixed juice	19.57	21.73	41.52	26.26	22.16	48.39	53.58	40.76	26.52	29.57	30.54	60.12	39.91	23.36	66.60
Tons non-pol. in mixed juice	2.47	2.86	5.37	4.90	3.89	8.78	8.38	6.46	3.86	4.65	4.74	9.40	6.31	3.71	10.54
Tons of sugar produced	-	-	37.53	-	-	42.55	49.43	35.82	23.82	-	-	53.08	-	-	60.44
COMPOSITION OF CANE CRUSHED															
Pol % cane	15.15	15.19	15.18	13.34	14.89	14.01	14.46	14.07	15.28	13.91	14.46	14.19	14.58	14.47	14.55
Fibre % cane	15.59	15.23	15.38	13.07	13.25	13.15	12.90	14.22	14.88	14.45	14.44	14.44	14.16	13.21	13.89
Brix % cane	17.32	17.40	17.36	16.18	17.74	16.85	17.03	16.45	17.72	16.41	17.10	16.76	17.04	17.24	17.10
Ash % cane	-	-	-	1.32	0.95	1.16	1.36	-	-	-	-	-	-	-	-
ERC % cane	13.42	13.44	13.43	11.33	12.85	11.99	12.58	12.27	13.41	12.04	12.51	12.28	12.72	12.47	12.65
ERC % pol in cane	88.55	88.48	88.51	84.94	86.27	85.55	86.98	87.19	87.77	86.57	86.52	86.54	87.28	86.21	86.98

*Cane diffuser

Table B2. continued

SYMBOLS OF FACTORIES	MH-A*	MH-B	MH-AVE	UB-A*	UB-B	UB-AVE	SM	NH*	DW*	HV-A*	HV-B*	HV-AVE	TR-A*	TR-B	TR-AVE
EXTRACTION															
Extraction (pol based)	96.24	97.74	97.10	96.76	98.06	97.36	96.74	96.52	96.63	97.71	97.79	97.75	97.29	95.72	96.84
Corrected reduced extraction	95.66	97.41	96.67	95.70	97.38	96.46	95.23	95.90	96.10	97.35	97.38	97.37	96.77	94.51	96.16
Imbibition % cane	44.85	55.91	51.19	40.22	50.34	44.58	43.71	45.41	42.74	31.83	34.96	33.39	49.54	39.65	46.72
Imbibition % fibre	305	375	346	330	393	358	376	324	287	225	248	236	350	300	336
Preparation index	90	92	91	92	93	92	90	91	89	92	91	92	92	91	91
Pol factor	100.86	100.46	100.63	-	-	-	98.69	99.95	99.24	97.25	101.11	99.18	-	-	-
Brix factor	102.97	102.82	102.88	-	-	-	100.00	101.24	100.35	98.41	102.54	100.47	-	-	-
RECOVERIES															
Boiling house recovery (pol)	-	-	90.08	-	-	87.41	91.50	87.17	89.36	-	-	87.43	-	-	89.69
Overall recovery (pol)	-	-	87.46	-	-	85.09	88.52	84.14	86.35	-	-	85.47	-	-	86.86
Ton cane per ton sugar	-	-	7.51	-	-	8.34	7.75	8.38	7.54	-	-	8.17	-	-	7.82
Ton cane per ton 96 pol sugar	-	-	7.23	-	-	8.05	7.50	8.11	7.27	-	-	7.92	-	-	7.60
BALANCES															
Pol lost % pol in cane															
- lost in bagasse (a)	-	-	2.90	-	-	2.64	3.26	3.48	3.37	-	-	2.25	-	-	3.16
- lost in filter cake (b)	-	-	0.17	-	-	0.12	0.56	0.07	0.10	-	-	0.03	-	-	0.16
- lost in final molasses (c)	-	-	7.38	-	-	9.18	6.51	9.39	8.06	-	-	8.55	-	-	7.64
- undetermined losses (d)	-	-	2.09	-	-	2.96	1.16	2.91	2.11	-	-	3.70	-	-	2.18
Non-pol ratio	-	-	1.10	-	-	1.01	0.96	0.91	0.97	-	-	0.98	-	-	0.99

*Cane diffuser

Table C1 (Part 1). Analysis of bagasse, juices, filter cake, syrup and final molasses South African mills (season 2002-2003).

SYMBOLS OF FACTORIES	ML *	KM-A *	KM-B *	KM-AVE	PG *	UF *	EN **	FX-A *	FX-B *	FX-AVE	AK *	DL	MS-A *	MS-B *	MS-AVE
FINAL BAGASSE															
Pol % bagasse	0.87	0.84	0.84	0.84	1.30	1.13	1.08	0.66	0.70	0.68	0.86	1.12	0.53	0.58	0.56
Moisture % bagasse	51.89	45.56	46.42	46.00	49.21	50.28	51.34	53.48	53.26	53.37	49.29	50.49	51.81	51.04	51.39
Fibre % bagasse	46.36	52.56	51.69	52.11	48.55	47.60	46.73	44.70	44.83	44.76	48.91	47.30	46.44	46.81	46.64
Ash % bagasse	3.35	-	-	4.31	4.97	4.11	3.86	-	-	-	2.27	-	-	-	2.87
LCV in kJ per kg bagasse ##	6826	-	-	7855	7048	6998	6833	-	-	-	7576	-	-	-	7017
MIXED JUICE															
Mixed juice % cane	125.26	124.13	116.62	120.26	113.42	122.73	121.95	121.89	122.41	122.14	126.00	118.65	126.59	129.78	128.35
Brix % mixed juice	12.91	12.98	13.69	13.34	13.46	12.84	12.05	12.41	12.31	12.36	12.05	12.34	11.75	11.34	11.52
Sucrose purity	87.14	86.66	86.76	86.71	86.11	87.64	88.33	85.88	85.47	85.68	87.06	87.13	85.88	85.47	85.65
Apparent purity	86.16	85.62	85.82	85.73	85.10	86.89	87.46	85.14	84.78	84.96	86.33	86.03	84.84	84.62	84.72
Purity difference (MJ - DAC)	-0.09	0.13	0.35	0.24	-0.39	-0.06	0.32	0.20	0.15	0.18	-0.02	0.58	0.49	0.56	0.53
(Glucose + fructose) % sucrose	4.76	-	-	4.77	5.45	3.73	3.79	-	-	4.59	3.79	4.43	-	-	4.80
Suspended solids % mixed juice	0.11	0.06	0.07	0.06	0.21	0.49	0.91	0.10	0.10	0.10	0.33	0.93	0.13	0.14	0.13
Pol/sucrose ratio	0.9888	0.9881	0.9892	0.9887	0.9882	0.9914	0.9901	0.9913	0.9919	0.9916	0.9917	0.9873	0.9880	0.9900	0.9891
CLARIFIED JUICE															
Brix % clarified juice	13.18	-	-	13.11	12.86	12.56	11.87	-	-	11.81	11.92	11.94	-	-	11.48
Apparent purity	85.40	-	-	85.33	85.33	86.75	86.48	-	-	84.12	86.04	85.41	-	-	83.71
Purity difference (CJ - MJ)	-0.76	-	-	-0.40	0.23	-0.14	-0.98	-	-	-0.84	-0.29	-0.62	-	-	-1.01
Average pH	6.8	-	-	6.9	7.1	7.6	7.0	-	-	7.1	7.1	7.0	-	-	7.0
FILTER CAKE															
Pol % filter cake	-	-	-	-	2.47	2.02	0.69	-	-	-	-	1.57	-	-	-
Moisture % filter cake	-	-	-	-	73.76	70.00	65.81	-	-	-	-	-	-	-	-
Filter cake % cane	-	-	-	-	0.94	3.64	3.63	-	-	-	-	4.00	-	-	-
Filter wash index	98.0	-	-	101.7	104.7	102.2	101.5	-	-	104.7	101.1	103.3	-	-	100.3
Purity difference (CJ - filtrate)	-	-	-	-	-	1.83	0.71	-	-	-	-	0.85	-	-	-
SYRUP															
Brix % syrup	65.41	-	-	67.68	67.38	65.61	61.45	-	-	65.45	64.81	64.67	-	-	68.39
Apparent purity	85.27	-	-	84.98	85.37	85.81	86.76	-	-	84.59	86.16	85.85	-	-	84.88
Purity difference (Syrup - MJ)	-0.89	-	-	-0.75	0.27	-1.08	-0.70	-	-	-0.37	-0.17	-0.18	-	-	0.16
Average pH	6.1	-	-	6.0	6.4	6.3	6.4	-	-	6.1	6.2	6.2	-	-	6.1

*Cane diffuser **Bagasse diffuser

##LCV = 18309 – 31,14 Brix % bagasse – 207,63 Moisture % bagasse – 196,05 Ash % bagasse

Table C1 (Part 1). continued

SYMBOLS OF FACTORIES	ML *	KM-A *	KM-B *	KM-AVE	PG *	UF *	EN **	FX-A *	FX-B *	FX-AVE	AK *	DL	MS-A *	MS-B *	MS-AVE
FINAL MOLASSES															
Refractometer brix	85.07	-	-	85.23	90.08	86.36	86.36	-	-	85.75	92.52	89.36	-	-	84.57
Pol/refractometer brix purity	33.29	-	-	32.88	33.86	33.79	33.40	-	-	35.25	34.63	31.12	-	-	32.74
Sucrose/refractometer brix purity	36.43	-	-	37.42	36.66	35.80	36.05	-	-	37.90	36.72	34.34	-	-	35.56
Conductivity ash %	14.87	-	-	17.15	15.56	16.47	15.14	-	-	15.43	16.89	15.74	-	-	15.05
(Glucose + fructose)/ash ratio	1.03	-	-	0.74	0.90	0.70	0.84	-	-	0.76	0.74	0.92	-	-	0.87
Fructose %	8.12	-	-	7.50	7.95	6.68	7.44	-	-	6.88	7.28	8.25	-	-	7.37
Glucose %	7.14	-	-	5.22	6.11	4.91	5.31	-	-	4.92	5.13	6.30	-	-	5.66
TPD based on molasses (made)	6.2	-	-	3.3	4.6	3.1	2.8	-	-	4.4	2.8	2.5	-	-	3.2
TPD based on mixed juice	6.5	-	-	4.7	6.3	4.2	4.0	-	-	5.3	3.8	3.5	-	-	4.1
Final molasses at 85 brix % cane	3.87	-	-	3.90	4.15	3.77	3.29	-	-	4.22	3.89	3.50	-	-	3.84
Pol/sucrose ratio	0.9139	-	-	0.8785	0.9235	0.9439	0.9265	-	-	0.9301	0.9432	0.9064	-	-	0.9209

*Cane diffuser **Bagasse diffuser

##LCV = 18309 – 31,14 Brix % bagasse – 207,63 Moisture % bagasse – 196,05 Ash % bagasse

Table C1 (Part 2). Analysis of bagasse, juices, filter cake, syrup and final molasses South African mills (season 2002-2003).

SYMBOLS OF FACTORIES	GH-A *	GH-B	GH-AVE	NB	UC *	ES *	SZ-A *	SZ-B *	SZ-AVE	UK *	INDUSTRY
FINAL BAGASSE											
Pol % bagasse	0.79	1.10	0.99	1.35	1.13	1.15	0.78	0.77	0.77	0.75	0.92
Moisture % bagasse	48.54	47.14	47.62	51.12	53.69	50.38	46.84	47.50	47.18	49.38	50.08
Fibre % bagasse	49.88	50.72	50.43	46.67	44.42	47.69	51.63	50.93	51.27	48.82	48.01
Ash % bagasse	-	-	2.63	3.93	2.76	4.57	-	-	2.92	4.00	2.91
LCV in kJ per kg bagasse ##	-	-	7846	6858	6564	6894	-	-	7894	7217	7261
MIXED JUICE											
Mixed juice % cane	118.86	118.98	118.94	108.08	111.25	131.66	130.98	130.50	130.73	137.46	123.03
Brix % mixed juice	12.84	12.58	12.67	14.30	14.13	11.77	11.76	11.92	11.84	11.13	12.50
Sucrose purity	87.10	87.68	87.48	89.07	89.55	88.71	88.13	88.03	88.08	87.99	87.31
Apparent purity	86.15	86.81	86.58	88.07	88.70	88.09	87.44	87.27	87.35	87.42	86.46
Purity difference (MJ - DAC)	0.25	0.82	0.62	-0.16	-0.23	0.06	0.07	-0.11	-0.03	0.07	0.10
(Glucose + fructose) % sucrose	-	-	4.17	3.62	3.35	3.17	-	-	3.31	3.12	4.20
Suspended solids % mixed juice	0.24	0.80	0.61	0.86	0.11	0.29	0.10	0.11	0.11	0.21	0.30
Pol/sucrose ratio	0.9891	0.9901	0.9897	0.9888	0.9905	0.9930	0.9922	0.9914	0.9918	0.9934	0.9903
CLARIFIED JUICE											
Brix % clarified juice	-	-	12.29	14.46	14.49	11.84	-	-	11.51	10.84	12.36
Apparent purity	-	-	86.41	88.17	87.96	87.55	-	-	87.47	86.64	86.89
Purity difference (CJ - MJ)	-	-	-0.17	0.10	-0.74	-0.54	-	-	0.12	-0.78	-0.43
Average pH	-	-	7.1	7.1	7.0	7.1	-	-	7.1	6.9	7.1
FILTER CAKE											
Pol % filter cake	-	-	1.11	2.29	1.50	2.78	-	-	1.16	-	1.80
Moisture % filter cake	-	-	72.23	70.85	73.20	72.11	-	-	71.76	-	70.97
Filter cake % cane	-	-	2.97	6.09	0.73	0.58	-	-	1.19	-	1.36
Filter wash index	-	-	103.1	98.9	97.5	99.4	-	-	102.9	102.7	101.1
Purity difference (CJ - filtrate)	-	-	1.18	0.94	3.16	-	-	-	1.42	-	1.49
SYRUP											
Brix % syrup	-	-	65.42	67.92	66.26	62.58	-	-	64.68	65.98	65.79
Apparent purity	-	-	86.32	87.73	88.30	87.68	-	-	87.73	87.11	86.16
Purity difference (Syrup - MJ)	-	-	-0.26	-0.34	-0.40	-0.41	-	-	0.38	-0.31	-0.30
Average pH	-	-	6.1	6.2	6.3	6.1	-	-	6.0	6.1	6.2

*Cane diffuser **Bagasse diffuser

##LCV = 18309 – 31,14 Brix % bagasse – 207,63 Moisture % bagasse – 196,05 Ash % bagasse

Table C1 (Part 2). continued

SYMBOLS OF FACTORIES	GH-A *	GH-B	GH-AVE	NB	UC *	ES *	SZ-A *	SZ-B *	SZ-AVE	UK *	INDUSTRY
FINAL MOLASSES											
Refractometer brix	-	-	80.88	81.97	84.22	81.53	-	-	82.08	81.82	85.09
Pol/refractometer brix purity	-	-	35.19	34.89	33.71	37.64	-	-	37.02	36.23	34.46
Sucrose/refractometer brix purity	-	-	37.48	38.24	36.95	39.84	-	-	39.33	38.03	37.24
Conductivity ash %	-	-	14.06	12.74	13.85	12.19	-	-	13.43	13.78	14.89
(Glucose + fructose)/ash ratio	-	-	0.81	0.92	0.72	0.81	-	-	0.79	0.80	0.82
Fructose %	-	-	6.77	7.15	6.65	6.08	-	-	6.42	6.47	7.14
Glucose %	-	-	4.68	4.54	3.30	3.75	-	-	4.26	4.61	5.13
TPD based on molasses (made)	-	-	4.1	5.8	3.3	6.9	-	-	5.9	4.5	4.4
TPD based on mixed juice	-	-	5.4	6.7	5.9	7.7	-	-	6.4	4.7	5.4
Final molasses at 85 brix % cane	-	-	3.64	3.44	2.97	3.46	-	-	3.63	3.42	3.73
Pol/sucrose ratio	-	-	0.9389	0.9123	0.9123	0.9448	-	-	0.9413	0.9526	0.9252

*Cane diffuser **Bagasse diffuser

##LCV = 18309 – 31,14 Brix % bagasse – 207,63 Moisture % bagasse – 196,05 Ash % bagasse

Table C2. Analysis of bagasse, juices, filter cake, syrup and final molasses Swaziland, Malawi and Zimbabwe mills (season 2002-2003).

SYMBOLS OF FACTORIES	MH-A *	MH-B	MH-AVE	UB-A *	UB-B	UB-AVE	SM	NH *	DW *	HV-A *	HV-B *	HV-AVE	TR-A *	TR-B	TR-AVE
FINAL BAGASSE															
Pol % bagasse	1.87	1.09	1.42	1.64	1.12	1.42	1.80	1.65	1.78	1.10	1.09	1.10	1.29	2.06	1.51
Moisture % bagasse	48.69	50.80	49.92	50.50	48.33	49.57	52.25	50.38	45.88	48.92	49.05	48.99	51.59	52.19	51.76
Fibre % bagasse	48.37	47.32	47.76	46.23	49.45	47.60	44.48	47.19	51.34	48.72	48.34	48.53	46.38	43.88	45.68
Bagasse % cane	30.38	31.50	31.02	26.37	25.88	26.16	26.12	29.72	28.98	29.01	29.20	29.10	30.54	30.11	30.42
Ash % bagasse	-	-	-	-	-	2.90	2.99	-	-	-	-	-	-	-	-
LCV in kJ per kg bagasse ##	-	-	-	-	-	7361	6773	-	-	-	-	-	-	-	-
MIXED JUICE															
Mixed juice % cane	114.47	124.41	120.17	113.86	124.46	118.43	117.59	115.68	113.76	102.82	105.77	104.29	119.09	109.54	116.37
Brix % mixed juice	14.35	13.51	13.85	13.46	13.79	13.61	13.76	13.60	14.87	15.30	15.45	15.38	13.79	14.65	14.02
Apparent purity	88.79	88.36	88.54	84.28	85.08	84.64	86.48	86.32	87.29	86.41	86.55	86.48	86.35	86.28	86.33
Purity difference (MJ - DAC)	-0.54	-1.02	-0.82	0.00	0.00	0.00	0.43	-0.30	0.08	0.65	0.79	0.72	0.00	0.00	0.00
Suspended solids % mixed juice	0.78	0.26	0.47	0.78	0.36	0.59	1.09	0.17	-	0.31	0.30	0.31	0.31	0.68	0.40
CLARIFIED JUICE															
Brix % clarified juice	-	-	13.93	-	-	13.63	13.64	13.28	14.30	-	-	15.60	-	-	13.84
Apparent purity	-	-	88.61	-	-	84.41	86.07	87.12	88.00	-	-	86.92	-	-	86.23
Purity difference (CJ - MJ)	-	-	0.07	-	-	-0.23	-0.41	0.80	0.71	-	-	0.44	-	-	-0.10
Average pH	-	-	7.1	-	-	7.2	7.1	7.0	6.6	-	-	6.6	-	-	7.0
FILTER CAKE															
Pol % filter cake	-	-	1.08	-	-	0.71	1.70	1.97	0.80	-	-	1.52	-	-	0.99
Moisture % filter cake	-	-	68.01	-	-	-	75.65	72.39	71.61	-	-	74.35	-	-	-
Filter cake % cane	-	-	2.31	-	-	2.44	4.74	0.53	1.88	-	-	0.33	-	-	2.32
Filter wash index	-	-	99.4	-	-	99.8	100.9	102.4	104.0	-	-	98.6	-	-	101.3
Purity difference (CJ - filtrate)	-	-	1.38	-	-	0.38	2.42	2.87	-	-	-	6.96	-	-	1.75

*Cane diffuser

#Reducing sugars determined by Lane & Eynon method

##LCV = 18309 ˜ 31,14 Brix % bagasse ˜ 207,63 Moisture % bagasse ˜ 196,05 Ash % bagasse

Table C2. continued

SYMBOLS OF FACTORIES	MH-A *	MH-B	MH-AVE	UB-A *	UB-B	UB-AVE	SM	NH *	DW *	HV-A *	HV-B *	HV-AVE	TR-A *	TR-B	TR-AVE
SYRUP															
Brix % syrup	-	-	66.11	-	-	61.72	67.93	65.36	61.14	-	-	54.29	-	-	66.35
Apparent purity	-	-	88.44	-	-	83.88	86.21	87.30	88.36	-	-	87.22	-	-	86.29
Purity difference (Syrup - MJ)	-	-	-0.10	-	-	-0.76	-0.27	0.98	1.07	-	-	0.74	-	-	-0.04
Average pH	-	-	6.5	-	-	6.2	6.2	6.3	6.4	-	-	6.2	-	-	6.1
FINAL MOLASSES															
Refractometer brix	-	-	82.49	-	-	82.58	85.92	85.95	84.88	-	-	84.15	-	-	85.48
Pol/refractometer brix purity	-	-	35.27	-	-	34.41	31.95	41.43	37.69	-	-	37.49	-	-	34.64
Purity difference (true-target)	-	-	-	-	-	2.51	-	-	-	-	-	8.64	-	-	-
Reducing sugars % #	-	-	17.72	-	-	19.63	16.52	-	18.96	-	-	15.92	-	-	-
Sulphated ash %	-	-	-	-	-	13.92	14.90	-	-	-	-	13.66	-	-	-
Reducing sugars/ash ratio	-	-	-	-	-	1.41	1.11	-	-	-	-	1.17	-	-	-
Final molasses at 85 brix % cane	-	-	3.74	-	-	4.39	3.47	3.75	3.85	-	-	3.81	-	-	3.78

*Cane diffuser

#Reducing sugars determined by Lane & Eynon method

LCV = 18309 ˜ 31,14 Brix % bagasse ˜ 207,63 Moisture % bagasse ˜ 196,05 Ash % bagasse

Table D1. Massecuites, exhaustions, clarifying agents and additional fuels South African mills (season 2002-2003).

SYMBOLS OF FACTORIES	ML	KM	PG	UF	EN	FX	AK	DL	MS	GH	NB	UC	ES	SZ	UK	INDUSTRY
A-MASSECUITE																
m^3 per ton brix in mixed juice	1.09	-	1.14	1.15	0.96	0.95	0.97	-	1.01	1.13	1.20	1.03	1.03	1.03	1.01	0.90
Refractometer brix of massecuite	93.92	92.86	92.80	92.26	92.62	92.95	92.66	92.64	92.47	92.67	93.22	92.02	92.89	92.90	93.20	92.89
Purity of massecuite	86.34	84.38	86.09	85.83	86.58	85.51	86.24	85.36	85.60	86.88	87.70	87.82	86.96	86.61	86.69	86.46
Purity of A-molasses	70.68	66.14	70.15	69.97	68.96	67.79	68.64	68.11	68.43	70.65	69.85	72.54	70.82	68.15	67.23	69.40
Purity drop	15.66	18.24	15.94	15.86	17.62	17.72	17.60	17.25	17.17	16.23	17.85	15.28	16.14	18.46	19.46	17.06
Exhaustion	61.86	63.84	62.03	61.53	65.56	64.34	65.08	63.37	63.54	63.65	67.51	63.36	63.61	66.92	68.50	64.49
Purity of A-massecuite - purity syrup	1.07	-0.60	0.72	0.02	-0.18	0.92	0.08	-0.49	0.72	0.56	-0.03	-0.48	-0.72	-1.12	-0.42	0.30
Purity of remelt	86.04	82.83	83.05	81.84	84.64	87.37	85.78	85.35	86.13	84.68	83.99	86.96	83.82	82.98	85.70	84.71
B-MASSECUITE																
m^3 per ton brix in mixed juice	0.41	-	0.43	0.55	0.30	0.35	0.32	-	0.26	0.41	0.56	0.33	0.31	0.29	0.35	0.32
Refractometer brix of massecuite	95.13	95.67	94.70	95.01	93.77	95.55	94.11	92.99	93.74	95.09	95.45	94.77	95.19	94.87	94.88	94.93
Purity of massecuite	69.12	65.77	70.15	70.05	69.98	70.35	69.51	68.51	67.83	70.65	70.36	73.19	71.71	68.57	70.66	70.00
Purity of B-molasses	50.26	44.09	49.38	48.10	48.34	48.30	50.44	47.82	47.46	47.76	47.04	46.79	48.78	46.33	47.47	48.22
Purity drop	18.86	21.68	20.77	21.95	21.64	22.05	19.07	20.69	20.37	22.89	23.32	26.40	22.93	22.24	23.19	21.78
Exhaustion	54.86	58.96	58.49	60.38	59.86	60.63	55.36	57.88	57.16	62.02	62.58	67.79	62.43	60.43	62.48	60.09
C-MASSECUITE																
m^3 per ton brix in mixed juice	0.08	-	0.40	0.23	0.23	0.30	0.25	-	0.24	0.29	0.22	0.16	0.21	0.22	0.29	0.20
Refractometer brix of massecuite	97.61	96.48	97.61	97.52	96.92	97.24	97.62	96.54	96.65	97.44	98.15	98.08	97.64	97.41	98.05	97.51
Purity of massecuite	55.98	52.65	54.20	52.35	52.49	56.23	57.01	53.95	53.54	54.23	53.38	54.03	54.99	54.63	56.45	54.78
Purity of C-molasses	33.29	32.88	33.86	33.79	33.40	35.25	34.63	31.12	32.74	35.19	34.89	33.71	37.64	37.02	36.23	34.46
Crystal content	33.20	28.42	30.02	27.34	27.78	31.50	33.42	32.00	29.89	28.63	27.88	30.07	27.16	27.24	31.09	30.23
Exhaustion	60.76	55.95	56.74	53.55	54.61	57.62	60.05	61.43	57.76	54.18	53.21	56.73	50.59	51.19	56.18	56.60
TOTAL VOLUME ALL RAW MASSECUITES																
m^3 per ton brix in mixed juice	1.58	-	1.97	1.93	1.48	1.61	1.54	-	1.52	1.82	1.98	1.52	1.54	1.54	1.65	1.42

**1 ton coal equivalent to 4 tons bagasse;
1 ton firewood equivalent to 1,2 rons bagasse
#1 ton sulphur dioxide equivalent to 0,5 tons sulphur

Table D1. continued

SYMBOLS OF FACTORIES	ML	KM	PG	UF	EN	FX	AK	DL	MS	GH	NB	UC	ES	SZ	UK	INDUSTRY
WHITE SUGAR MASSECUITES																
Kg sugar per m^3 massecuite	469	-	519	592	-	-	-	-	-	534	524	-	-	-	-	514
Tons limestone per 1000 tons white sugar	-	-	64.88	-	-	-	-	-	-	30.32	-	-	-	-	-	-
Tons coke/1000 tons white sugar	-	-	0.70	-	-	-	-	-	-	3.39	-	-	-	-	-	-
Tons phosphoric acid/1000 tons white sugar	-	-	-	-	-	-	-	-	-	-	0.53	-	-	-	-	-
Tons sulphur/1000 tons white sugar	0.19	-	0.32	4.59	-	-	-	-	-	0.25	0.05	-	-	-	-	-
Phosphoric acid ppm mixed juice	-	-	-	-	-	-	-	-	-	1.82	-	25.70	47.53	3.62	10.07	5.08
Flocculant ppm mixed juice	3.72	1.89	2.82	3.36	2.42	4.35	3.18	2.25	4.22	3.30	7.12	3.59	8.04	5.07	2.11	4.03
Tons lime per 1000 tons cane	1.67	0.23	-	0.63	-	0.56	0.60	0.58	0.68	-	0.58	0.46	0.51	0.53	0.51	0.55
Enzyme ppm sugar	-	-	-	-	18.09	-	-	30.35	2.23	17.29	-	-	24.70	27.48	13.91	8.41
ADDITIONAL FUELS PER 1000 TC																
Tons of coal	15.94	0.87	9.75	9.36	8.12	14.40	1.26	0.25	13.57	0.01	11.62	4.17	2.38	-	0.55	6.37
Tons of wood	-	-	-	-	0.55	-	0.13	1.52	0.02	-	-	0.34	0.23	-	-	0.14
Converted into bagasse**	63.77	3.47	39.01	37.43	33.15	57.59	5.17	2.82	54.31	0.05	46.50	17.09	9.81	-	2.19	25.66

**1 ton coal equivalent to 4 tons bagasse;
1 ton firewood equivalent to 1,2 rons bagasse
#1 ton sulphur dioxide equivalent to 0,5 tons sulphur

Table D2. Massecuites, exhaustions, clarifying agents and additional fuels Swaziland, Malawi and Zimbabwe mills (season 2002-2003).

SYMBOLS OF FACTORIES	MH	UB	SM	NH	DW	HV	TR
A-MASSECUITE							
m^3 per ton brix in mixed juice	1.33	1.13	0.99	1.28	-	1.07	1.18
Refractometer brix of massecuite	92.47	93.62	93.25	93.50	90.80	91.51	92.56
Purity of massecuite	89.46	84.63	86.42	87.38	88.36	87.38	85.01
Purity of A-molasses	75.61	70.72	71.31	74.23	74.39	71.33	68.39
Purity drop	13.85	13.91	15.11	13.15	13.97	16.05	16.62
Exhaustion	63.48	56.13	60.94	58.40	61.73	64.07	61.85
Purity of A-massecuite - purity syrup	1.02	0.75	0.21	0.08	0.00	0.16	-1.28
Purity of remelt	87.42	85.36	86.24	86.31	88.92	87.23	81.56
B-MASSECUITE							
m^3 per ton brix in mixed juice	0.48	0.38	0.34	-	0.61	-	0.52
Refractometer brix of massecuite	93.83	95.36	96.31	93.08	92.89	-	94.73
Purity of massecuite	76.04	68.60	71.60	72.69	70.34	-	68.37
Purity of B-molasses	54.43	47.86	45.63	55.50	53.10	-	49.28
Purity drop	21.61	20.74	25.97	17.19	17.24	-	19.09
Exhaustion	62.36	57.98	66.71	53.14	52.26	-	55.05
C-MASSECUITE							
m^3 per ton brix in mixed juice	0.24	0.24	0.26	0.24	0.23	-	0.24
Refractometer brix of massecuite	97.85	97.48	98.86	96.87	94.86	-	96.93
Purity of massecuite	56.86	52.57	54.61	57.70	56.45	-	55.45
Purity of C-molasses	35.27	34.41	31.95	41.43	37.69	37.49	34.64
Crystal content	32.64	26.98	32.92	26.91	28.56	-	30.86
Exhaustion	58.66	52.66	60.98	48.14	53.34	-	57.42
TOTAL VOLUME ALL RAW MASSECUITES							
m^3 per ton brix in mixed juice	2.06	1.76	1.59	-	-	-	1.95

**1 ton coal equivalent to 4 tons bagasse;
1 ton firewood equivalent to 1,2 rons bagasse
#1 ton sulphur dioxide equivalent to 0,5 tons sulphur

Table D2. continued

SYMBOLS OF FACTORIES	MH	UB	SM	NH	DW	HV	TR
WHITE SUGAR MASSECUITES							
Kg sugar per m^3 massecuite	630	537	-	460	483	-	-
Tons phosphoric acid/1000 tons white sugar	-	-	-	0.76	-	-	-
Tons sulphur/1000 tons white sugar	0.26	0.31	-	-	0.21	-	-
Phosphoric acid ppm mixed juice	-	-	-	0.1	-	-	-
Flocculant ppm mixed juice	0.9	0.2	1.5	4.0	3.6	1.4	2.3
Tons lime per 1000 tons cane	0.7	1.3	0.3	0.9	1.1	0.4	0.5
Enzyme ppm sugar	-	-	-	-	-	-	-
ADDITIONAL FUELS PER 1000 TONS CANE							
Tons of coal	33.48	13.97	6.47	-	-	3.51	7.26
Tons of wood	-	-	-	1.19	2.81	-	-
Converted into bagasse**	133.93	55.86	25.87	1.43	3.37	14.05	29.06

**1 ton coal equivalent to 4 tons bagasse;
1 ton firewood equivalent to 1,2 rons bagasse
#1 ton sulphur dioxide equivalent to 0,5 tons sulphur

Table E. Comparative manufacturing data of recent years (South African mills).

SEASON	2002/2003	2001/2002	2000/2001	1999/2000	1998/99
Throughput and time efficiency					
Tons cane per hour	301.36	296.25	308.86	299.39	296.08
Tons fibre per hour	43.85	43.61	45.43	43.25	42.38
Overall time efficiency	83.97	80.46	79.47	82.76	81.31
Cane					
Sucrose % cane	13.71	13.11	13.08	13.77	13.36
Fibre % cane	14.80	14.97	14.98	14.76	14.66
Mixed juice					
Sucrose purity	87.31	85.92	86.46	86.51	86.17
(Glucose + Fructose)/ash in MJ	0.98	1.11	1.14	1.15	1.34
Milling					
Imbibition % fibre	366	369	348	362	343
Extraction (sucrose based)	97.96	97.74	97.79	97.93	97.73
Pol % bagasse	0.92	0.95	0.95	0.94	1.00
Moisture % bagasse	50.08	50.81	49.95	50.81	51.00
Bagasse % cane	30.31	31.14	30.56	30.46	30.42
LCV bagasse kJ/kg	7261	6989	7108	6904	6958
Available kJ in bagasse/kg brix in MJ	14308	14594	14689	13493	13967
Recoveries					
Boiling house recovery (sucrose based)	89.11	88.18	88.97	88.33	88.08
Overall recovery (sucrose based)	87.29	86.19	86.99	86.50	86.09
Tons cane per ton sugar	8.32	8.81	8.74	8.36	8.65
Filter cake					
Pol % filter cake	1.80	1.79	1.51	1.55	1.44
Filter cake % cane	1.36	1.32	1.29	1.72	2.35

Table E. continued

SEASON	2002/2003	2001/2002	2000/2001	1999/2000	1998/99
Final molasses					
Brix % final molasses	85.09	84.44	84.26	83.87	83.64
Sucrose/refractometer brix purity	37.24	37.08	37.21	37.70	37.20
Tons final molasses at 85 brix % cane	3.73	3.93	3.70	3.97	3.93
Average sugar polarisation	99.54	99.48	99.47	99.51	99.51
Sucrose lost % sucrose in cane					
Lost in bagasse	2.04	2.26	2.21	2.07	2.27
Lost in filter cake	0.18	0.18	0.15	0.19	0.25
Lost in final molasses	8.62	9.45	8.96	9.25	9.29
Undetermined losses	1.87	1.92	1.67	1.99	2.10
Lost in boiling house	10.67	11.55	10.79	11.43	11.65
Total losses	12.71	13.81	13.00	13.50	13.91
m^3 massecuite per ton Bx in MJ					
A-massecuite	0.90	1.06	1.07	1.07	1.07
B-massecuite	0.32	0.40	0.38	0.39	0.38
C-massecuite	0.20	0.26	0.26	0.27	0.26
Total	1.42	1.73	1.71	1.74	1.71
Exhaustion of massecuites					
A-massecuite	64.49	63.81	63.56	63.57	62.73
B-massecuite	60.09	58.75	59.90	59.16	59.08
C-massecuite	56.60	55.94	56.53	54.80	56.49
Brix of syrup	65.79	64.30	64.09	64.76	64.99

Table F. Average manufacturing results by monthly periods for South African mills (season 2002-2003).

END OF MONTH PERIOD		30 MAR 02	27 APR 02	1 JUN 02	29 JUN 02	27 JUL 02	31 AUG 02	28 SEP 02	2 NOV 02	30 NOV 02	28 DEC 02	1 FEB 03
Tons of sugar made and estimated	Month	22307	181661	400716	338831	314737	394408	321267	396208	296915	99896	0
	To-date	22307	203968	604684	943515	1258252	1652660	1973927	2370135	2667050	2766946	2766946
Tons cane crushed	Month	217481	1692282	3428946	2779844	2490564	3260206	2628720	3224288	2422199	868025	0
	To-date	217481	1909763	5338709	8118553	10609117	13869323	16498043	19722331	22144530	23012555	23012555
Tons cane crushed per hour (actual crushing)	Month	210.50	282.36	310.73	313.15	307.71	312.23	313.96	303.09	289.47	245.60	0.00
	To-date	210.50	272.76	295.99	301.65	303.05	305.16	306.53	305.96	304.07	301.36	301.36
Sucrose % cane	Month	12.44	12.50	13.34	13.75	14.21	13.76	13.86	13.98	14.08	13.66	0.00
	To-date	12.44	12.49	13.04	13.28	13.50	13.56	13.61	13.67	13.71	13.71	13.71
Fibre % cane	Month	13.85	14.63	14.06	14.09	14.23	15.00	15.04	15.36	15.68	16.20	0.00
	To-date	13.85	14.54	14.23	14.19	14.20	14.39	14.49	14.63	14.75	14.80	14.80
RV % cane	Month	11.25	11.23	12.14	12.59	13.07	12.66	12.75	12.80	12.91	12.46	0.00
	To-date	11.25	11.23	11.82	12.08	12.31	12.40	12.45	12.51	12.55	12.55	12.55
Tons cane per ton sugar	Month	9.75	9.32	8.56	8.20	7.91	8.27	8.18	8.14	8.16	8.69	0.00
	To-date	9.75	9.36	8.83	8.60	8.43	8.39	8.36	8.32	8.30	8.32	8.32
Extraction (sucrose based)	Month	97.66	97.72	97.96	98.07	98.10	98.00	97.97	97.97	97.88	97.56	0.00
	To-date	97.66	97.72	97.88	97.94	97.98	97.99	97.98	97.98	97.97	97.96	97.96
Imbibition % fibre	Month	334	365	359	367	373	362	362	365	379	370	0
	To-date	334	361	360	362	365	364	364	364	366	366	366
Pol % bagasse	Month	0.99	0.92	0.94	0.92	0.93	0.90	0.92	0.91	0.93	1.02	0.00
	To-date	0.99	0.93	0.93	0.93	0.93	0.92	0.92	0.92	0.92	0.92	0.92
Moisture % bagasse	Month	52.78	51.51	50.56	50.09	49.80	49.68	49.62	49.71	50.28	49.19	0.00
	To-date	52.78	51.65	50.96	50.67	50.47	50.28	50.17	50.09	50.12	50.08	50.08
Boiling house recovery (sucrose based)	Month	84.11	87.37	88.99	90.00	90.22	89.30	89.58	89.27	88.44	86.77	0.00
	To-date	84.11	87.00	88.31	88.91	89.23	89.25	89.30	89.30	89.20	89.11	89.11

Table F. continued

END OF MONTH PERIOD		30 MAR 02	27 APR 02	1 JUN 02	29 JUN 02	27 JUL 02	31 AUG 02	28 SEP 02	2 NOV 02	30 NOV 02	28 DEC 02	1 FEB 03
Overall recovery (sucrose based)	Month	82.14	85.38	87.18	88.26	88.50	87.51	87.76	87.46	86.56	84.65	0.00
	To-date	82.14	85.01	86.44	87.08	87.43	87.45	87.50	87.50	87.39	87.29	87.29
Mixed juice sucrose purity	Month	85.21	84.62	86.21	87.01	88.01	88.38	88.13	87.52	87.73	87.53	0.00
	To-date	85.21	84.68	85.68	86.15	86.60	87.02	87.20	87.25	87.30	87.31	87.31
Pol/sucrose ratio in mixed juice	Month	0.9845	0.9862	0.9860	0.9888	0.9909	0.9887	0.9932	0.9950	0.9919	0.9921	0.0000
	To-date	0.9845	0.9860	0.9860	0.9870	0.9880	0.9881	0.9890	0.9900	0.9902	0.9903	0.9903
Sucrose/refractometer brix purity in final molasses	Month	38.42	36.56	35.54	36.10	36.99	36.87	38.67	37.87	38.36	41.18	0.00
	To-date	38.42	36.78	36.00	36.04	36.24	36.38	36.73	36.91	37.07	37.24	37.24
Sucrose lost in final molasses % sucrose in cane	Month	11.46	10.24	8.90	8.33	7.93	8.06	8.48	8.49	8.33	10.86	0.00
	To-date	11.46	10.38	9.41	9.03	8.75	8.59	8.57	8.56	8.53	8.62	8.62
Undetermined lost sucrose % sucrose in cane	Month	3.43	1.91	1.73	1.34	1.52	2.24	1.54	1.83	2.80	1.78	0.00
	To-date	3.43	2.08	1.85	1.67	1.63	1.78	1.74	1.75	1.87	1.87	1.87
Pol/sucrose ratio FM	Month	0.9409	0.8917	0.8784	0.8716	0.9066	0.9493	0.9560	0.9537	0.9656	0.9841	0.0000
	To-date	0.9409	0.8979	0.8857	0.8811	0.8868	0.9008	0.9097	0.9170	0.9223	0.9252	0.9252

Table G. Cane varieties and rainfall (percentage by weight) (season 2002-2003).

MILL	N11	N12	N14	N16	N17	N19	N21	N22	N23	N24	N25	N26	N27	N28	N29	N30	NCo 310	NCo 376	Mixed variety	Unknown & other	% Burnt	Rainfall* (mm)
ML	-	-	25.4	-	0.6	44.3	-	2.3	1.2	4.9	17.8	-	-	0.1	-	1.6	-	-	1.6	0.2	97.1	107
KM	-	-	37.4	-	0.2	42.9	-	3.5	0.2	1.4	8.6	0.2	-	0.6	-	0.3	-	-	2.6	2.0	99.6	233
PG	-	-	20.8	-	0.8	19.7	-	2.2	6.6	0.6	26.9	2.9	-	1.2	-	0.6	-	-	1.3	16.5	74.1	234
UF	-	2.4	2.8	-	10.5	31.7	1.4	4.0	-	0.5	0.4	0.1	5.3	-	5.8	-	0.6	20.0	13.9	0.5	98.9	433
EN	-	40.4	0.2	18.2	0.3	-	0.2	-	-	-	-	-	1.0	-	1.4	-	-	8.9	0.1	29.3	99.6	612
FX	-	2.8	2.5	0.1	5.4	14.6	0.3	0.9	1.6	0.1	3.0	0.5	10.0	0.2	2.2	0.3	-	22.1	2.9	30.3	74.3	712
AK	-	22.4	0.8	1.2	3.6	7.2	1.5	0.1	-	0.4	-	0.1	2.4	-	1.4	-	-	14.6	6.5	37.7	94.8	526
DL	-	18.3	0.3	11.2	3.2	3.8	2.5	-	-	-	-	-	2.6	-	0.7	-	-	15.2	1.8	40.2	75.2	600
MS	-	21.8	0.4	14.0	2.5	2.2	1.0	-	-	-	-	-	1.0	-	0.6	-	-	29.8	13.3	13.4	67.6	571
GH	-	20.8	1.2	7.5	3.9	3.8	0.8	-	-	-	0.2	-	2.3	-	1.6	-	-	22.8	2.3	32.9	77.2	722
NB	0.8	65.3	0.1	24.7	0.1	-	2.2	-	-	-	0.3	0.1	0.3	-	0.7	-	-	0.1	0.3	4.8	77.7	569
UC	0.6	59.5	-	34.9	-	0.2	2.3	0.2	0.1	-	0.2	0.2	0.1	-	-	-	-	-	-	1.5	100.0	622
ES	-	59.8	0.1	11.1	0.1	-	0.3	0.1	-	-	-	-	0.1	-	0.6	0.1	-	0.2	0.3	27.0	98.9	718
SZ	-	33.0	0.4	5.4	-	-	0.2	-	-	-	-	-	0.2	-	0.7	-	0.3	5.5	6.7	47.5	71.6	549
UK	-	30.6	0.9	2.7	-	-	1.5	-	-	-	-	-	0.4	-	0.8	-	-	12.4	1.4	49.0	89.7	751
Average SA Mills	0.1	22.4	7.3	7.1	2.1	12.9	0.8	1.0	0.7	0.6	4.2	0.3	1.9	0.1	1.0	0.2	0.1	10.4	4.1	22.3	84.6	
MH	-	-	6.8	-	0.2	29.6	-	0.0	3.8	0.0	1.5	-	-	0.2	-	-	0.2	57.4	0.2	0.0	-	126
UB	-	-	5.4	-	-	12.2	-	-	19.7	2.0	8.6	-	-	0.1	-	0.3	-	41.7	10.0	-	-	160
SM	-	-	6.3	-	0.2	5.9	-	-	15.4	-	4.5	-	-	0.1	-	0.2	-	63.5	3.9	-	-	148
NH	-	-	57.2	-	-	1.6	-	0.2	-	-	10.1	-	-	0.4	1.0	0.5	-	-	11.7	13.9	-	54
DW	-	-	15.9	-	0.6	24.4	-	-	-	-	5.7	0.3	-	-	-	-	-	26.3	3.5	23.3	-	32
HV	-	-	20.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	57.6	-	21.6	-	147
TR	-	-	41.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	46.6	0.8	11.2	-	321

*Rainfall during the crushing season

Table H. Transport summary South African mills (season 2002-2003)
percentage of cane transported.

MILLS	ML	KM	PG	UF	EN	FX	AK	DL	MS	GH	NB	UC	ES	SZ	UK	AVERAGE
SOUTH AFRICAN RAILWAYS						22.5										2.1
TRAMS				62.0												3.4
ARTICULATED TRUCK DRIVEN VEHICLES																
- Interlink		100.0	5.3	37.3	38.4	56.3	51.9	45.2	83.9	68.9	33.0	15.5	64.2	79.5	87.7	54.7
- Tri-Axle							8.3	8.5		6.9	0.6	0.1	9.9			2.2
- Hilo	100.0		38.5	0.7		1.3	0.3	1.7		12.5	3.9	1.1	7.6	17.7	0.2	14.0
RIGID CHASSIS VEHICLES																
- Truck			1.2								15.0	38.9		2.7	6.8	3.2
- Lorry					10.8		0.1	1.0	0.1		5.2	15.5			0.6	1.2
TRACTOR DRIVEN VEHICLES																
- Hilo			15.0				12.7	24.7	2.0	5.3	31.2	11.3	17.8			7.6
- Rig			0.1		50.9	19.8	17.1	18.0	2.2	6.3	10.9	6.4		0.1	0.5	6.7
- Interlink			39.9			0.1	9.7	0.9	11.9		0.2	11.3	0.6		4.2	4.9

Table J. Comparative data of reporting South African mills from 1925 onwards.

PERIOD (SEASON)	% Cane		Cane/sugar ratio		Extraction (pol based)	Pol % fibre in bagase	% Bagasse		Imbibition %		Mixed juice		Final molasses suc/brix purity (chem suc)	Boiling house recovery (pol based)	Overall recovery (pol based)
	Pol	Fibre	Tel Quel	96 pol sugar			Pol	Moisture	Cane	Fibre	Purity (pol based)	Reducing sugar/pol ratio			
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
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
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
Average 1975 - 1980	12.80	15.61	9.09	8.77	96.20	3.26	1.45	52.50	46.28	309	84.85	5.37	38.4	88.92	85.54
From 1981 onwards data are sucrose-based	*Sucrose*				*Sucrose-based*						*Sucrose based*	*(GL+FR)/ suc.ratio*	*Sucrose-based*	*Sucrose-based*	*Sucrose-based*
Average 1981 - 1984	**12.44**	**15.88**	**9.44**	**9.12**	**97.12**	**2.36**	**1.09**	**51.74**	**52.60**	**347**	**85.17**	**5.88**	**37.2**	**87.25**	**84.74**
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	2.03	0.95	51.27	54.3	368	85.44	5.44	36.7	87.70	85.65
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	50.92	53.0	355	85.70	5.43	36.8	88.33	86.21
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	86.39	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	8.99	97.87	1.77	0.83	51.27	55.1	366	83.66	6.14	36.9	86.50	84.66

Table J. continued

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**
1995	11.73	15.84	9.99	9.64	97.69	1.78	0.83	51.70	54.9	356	83.60	6.09	37.3	85.93	83.94
1996	12.60	15.36	9.20	8.88	97.72	1.92	0.90	51.40	50.4	337	85.38	5.23	37.3	87.82	85.82
1997	12.62	15.38	9.15	8.83	97.74	1.91	0.90	51.12	49.9	334	86.15	4.72	37.5	88.09	86.10
1998	13.36	14.66	8.65	8.35	97.73	2.11	1.00	51.00	49.1	343	86.17	5.31	37.2	88.08	86.09
1999	13.77	14.76	8.36	8.06	97.93	1.97	0.94	50.81	52.3	362	86.51	4.73	37.7	88.33	86.50
2000	13.08	14.98	8.74	8.44	97.79	1.97	0.95	49.95	51.25	348	86.46	4.82	37.2	88.97	86.99
2001	13.11	14.97	8.81	8.5	97.74	2.02	0.95	50.81	54.32	369	85.92	4.89	37.1	88.18	86.19
2002	13.71	14.80	8.32	8.02	97.96	1.93	0.92	50.08	53.26	366	87.31	4.12	37.2	89.11	87.29
Average 1995 - 2002	**13.00**	**15.09**	**8.90**	**8.59**	**97.79**	**1.95**	**0.92**	**50.86**	**51.9**	**352**	**85.94**	**4.99**	**37.3**	**88.06**	**86.11**