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REVIEW OF SOUTH AFRICAN SUGARCANE PRODUCTION IN THE 2019/20 SEASON

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Abstract

This paper characterises the South African sugarcane production for the 2019/20 milling season from an agricultural perspective. Production, climate, pest and disease, and economic data were used for this. This is to provide insight into successes and failures of recent production strategies and identify priorities for improved efficiency in producing high quality sugarcane in South Africa.

During the 2019/20 season the industry produced 19.24 million tons of cane harvested from an estimated 262 221 ha, translating to an estimated industry average cane yield of 73.4 t/ha. The cane to sugar ratio in 2019/20 was 8.64, with sugar production rising to 2.23 million tons.

Although total rainfall was generally slightly below average it was well distributed, providing good growing conditions during summer and ideal harvesting conditions for most of the winter harvesting period. This, together with generally increased irrigation water supplies, enabled excellent cane yields in 2019/20, marginally below the very high yields achieved in 2018/19. Cane quality was hampered slightly by early season rainfall in Mpumalanga and Midlands areas, but was excellent and much improved from 2018 in other areas.

Overall, Eldana seems to be well controlled, although infestation levels remained high in Pongola, and rose from a low base in the Midlands North area. Overall smut levels were down from 2018, but efforts to reduce incidence remain a priority in the northern irrigated areas, particularly Pongola. Ratoon stunt incidence was high in Umfolozi and was common in fields due for eradication in the Midlands South area. Brown rust was common on certain varieties in the rainfed areas.

Reduced sugar imports and a slight increase in local demand for sugar in 2019/20 resulted in a 18% increase in the Recoverable Value price. This increased typical net farm income per ton of cane for all farm types to positive levels after the losses incurred in 2018/19. Irrigated farms were better off than rainfed farms in 2019/20, while the sustainability of small-scale farms remains precarious.

Keywords: cane quality, cane yield, climate, diseases, profitability, pests, production, rainfall, mill supply area

Introduction

During the 2019/20 season, the South African sugar industry produced 19.24 million tons (Mt) of cane from an estimated 262 221 hectares harvested, translating to an estimated industry average cane yield of 73.4 t/ha. Corresponding amounts of the 2017/18 and 2018/19 seasons were 17.39 and 19.03 Mt harvested from 253 912 and 250 423 ha respectively, with average cane yields of 68.3 and 76.0 t/ha.

Sugar production rose to 2.23 Mt in 2019/20, compared to values of 1.99 and 2.19 Mt for the 2017/18 and 2018/19 seasons, respectively. The cane to sugar ratio was 8.64 in 2019/20, compared to values of 8.72 for 2017/18 and 8.66 for 2018/19.

Production data show that the long-term trend of declining cane production and area under cane have stabilized around 360 000 ha over the last four seasons, with production ranging from about 15 to 19 Mt depending on conditions (Figure 1). Cane production in recent seasons for the Darnall, Maidstone, UCL and Umzimkulu mills has been below or close to the possible threshold for economic viability of 1 Mt of cane per annum.

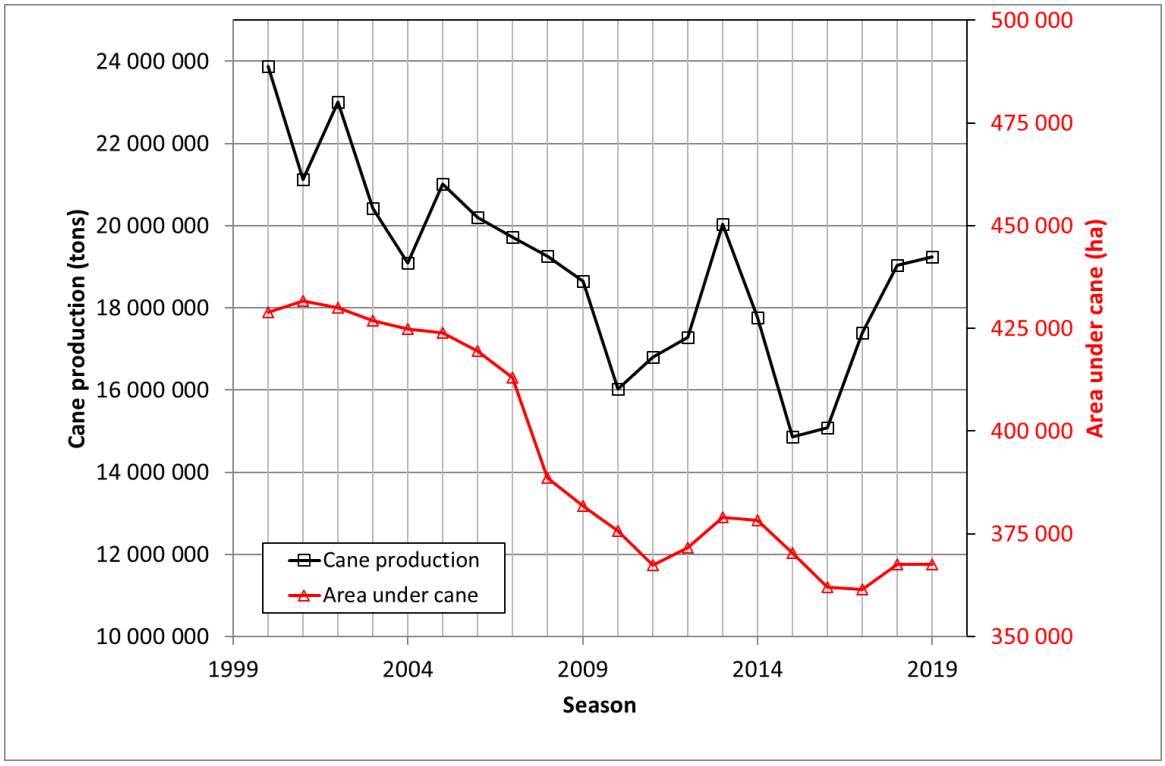

Figure 1. Cane production and area under cane in the South African sugar industry since 2000

This paper analyses cane production for the 2019/20 season and relates the key performance indicators of cane yield and cane quality to the main production factors of climate, pests and diseases, agronomic and economic conditions. This is to provide insight into successes and failures of recent production strategies,and identify priorities for improved efficiency in producing high quality sugarcane in South Africa.

Methodology

A similar methodology was followed to that used in previous reviews (Singels *et al.*, 2014). Production data were mostly analysed at the mill supply areas (MSA) level, while in some

cases pest and disease data were grouped or subdivided into Pest and Disease (P&D) Control Areas as defined by Local Pest, Disease and Variety Control Committees of the South African Sugar Association (SASA) (Figure 2).

The sugarcane produced in the 2019/20 milling season grew mostly from between April 2017 (long cycle cane) and December 2018 (annual cane), to between April 2019 and December 2019, when it was harvested. For simplicity, both the growing and milling seasons are referred to as the 2019 season.

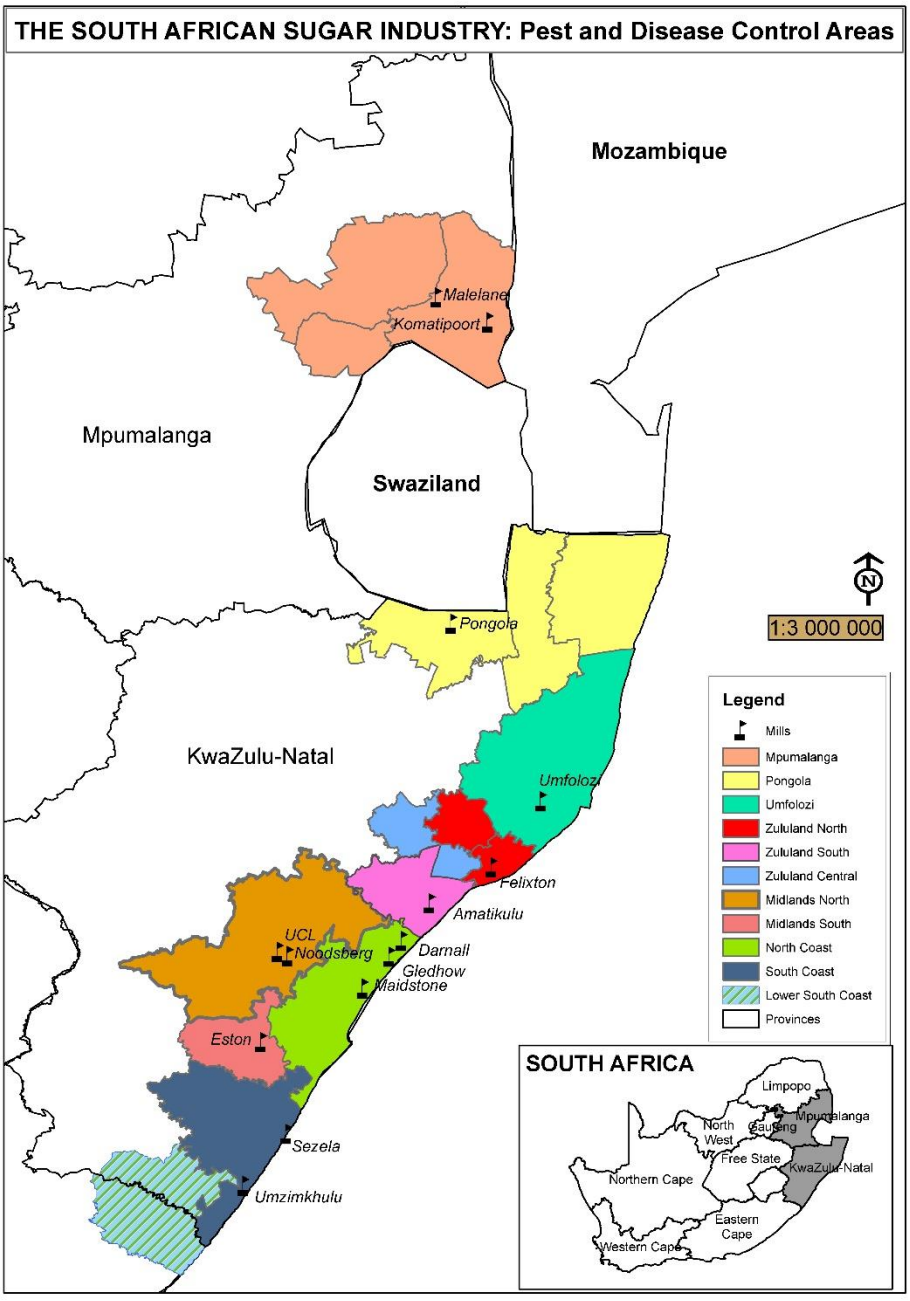

Figure 2. Map showing the 14 sugar mills and their location within Pest and Disease Control Areas of the South African sugar industry (source: South African Sugarcane Research Institute, Geographic Information Systems)

Production data

Production (cane deliveries and cane quality) data were obtained from the SASA Cane Testing Service database, while the estimated area harvested was gleaned from survey data from the SASA Industry Affairs or from data provided by the Mill Group Boards.

Rainfall, soil water status and irrigation water supply

Rainfall records from various weather stations, averaged per MSA, were obtained from the South African Sugarcane Research Institute (SASRI) weather database (https://sasri.sasa.org.za/weatherweb). Twelve-month totals leading up to each month of the 2019 milling season (e.g. 1 April 2018 to 31 March 2019, 1 May 2018 to 31 April 2019, and so forth) were compared to the corresponding long term mean (LTM) values. The deviations from the LTM (anomalies) were in turn compared to the corresponding anomalies for the 2017 and 2018 seasons.

Monthly average reference soil water content (SWC), spatially averaged for selected rainfed MSAs, was also extracted from the SASRI weather database. SWC is calculated through a water balance approach using rainfall and reference evapotranspiration data, and is defined as plant available water content for a hypothetical sugarcane crop growing on a soil with an available water holding capacity of 100 mm.

Weekly irrigation water allocations were obtained from the respective Water Boards for each water source, in the irrigated areas, then aggregated over the relevant growing period and expressed as a percentage of the full allocation.

Pests

SASRI Biosecurity teams surveyed approximately 89 800 ha during the 2019/20 season, as part of their annual industry-wide pest survey.

Eldana saccharina (Eldana) infestations are quantified as the number of larvae per 100 stalks (e/100). Larval numbers were averaged for different P&D areas, and for the industry over the 12-month period from June 2018 to May 2019, and compared to that of the previous two seasons, as well as to the mean over the last five and 15 seasons.

In the Zululand Central area, fields were regularly surveyed for the flying adult longhorn beetle (*Cacosceles newmannii*) and for its grubs.

Regular, non-quantitative scouting for the presence of yellow sugarcane aphid (*Sipha flava*) was conducted in the North Coast, South Coast, Lower South Coast and Midlands areas.

Diseases

SASRI Biosecurity teams inspected 6 450 commercial fields and 3 325 intended seedcane sources for smut (*Sporisorium scitamineum*), mosaic (*Sugarcane mosaic virus*) and off-types during the June 2018 to May 2019 period, covering an area of more than 32 000 ha. The prevalence of smut and mosaic is shown as percentage area inspected that was infected at three different levels. The permissible level (PL) for smut and mosaic refers to the level of infection (percent stools infected) that are allowed in a field in each P&D area. Note that, while disease surveys are mostly random, almost all the remaining fields of the smut-susceptible variety NCo376 in Zululand areas are inspected each year. The presence of other diseases e.g. rust is noted during these inspections and subjective severity ratings assigned. Tape from a spore trap positioned at the Komati Research Station to provide early warning of an orange rust (*Puccinia keuhnii*) incursion, is tested weekly for the presence of *P. kuehnii* spores using a molecular method. Stalk samples collected from 7 400 commercial fields and 1 501 intended

seedcane sources were tested for Ratoon Stunt (RSD - *Leifsonia* subsp*. xyli*). RSD prevalence is shown as percentage of commercial fields infected.

Economic information

Income and production cost data for large and small scale (less than 10 ha) farms for the 2017 season were obtained from a survey conducted by the SA Cane Growers' Association (SACGA, 2019a; 2019b). Data for the 2018 season were estimated using indices from the Crops and Markets Reports released by the Department of Agriculture, Forestry and Fisheries (DAFF, 2019). The projection for the 2019 season is based on the average Consumer Price Index (CPI) for the year 2019 (Statistics South Africa, 2019). Estimates for the 2018 season are based on actual changes in prices and costs, while estimates for the 2019 season were based on the average inflationary increase. The survey elicited cost and income data from a sample of large-scale growers from the 14 MSAs in South Africa. Average cost and income statistics reported in this study were determined by weighting MSA values by the deliveries of large-scale growers in each MSA. The Small-Scale Grower (SSG) projection for the 2019 season is based on the average Consumer Price Index (CPI) for the year 2019 (Statistics South Africa, 2019) as well as the agreed increases in contractor costs from various mill areas.

Results and Discussion

Firstly, sugarcane production conditions during the 2019 growing season are reviewed, focusing on rainfall, irrigation and pests and diseases. The impacts of these factors on cane productivity are then discussed, followed by a brief review of economic conditions and its impacts on grower profitability.

Production conditions

Rainfall and irrigation

Growing season total rainfall was near to, or slightly below normal (long-term mean) for the majority of MSAs (Figure 3). Malelane, Komati and Amatikulu, however, recorded rainfall 15-20% below normal. Industry average rainfall was therefore also below normal.

Rainfall in rainfed production areas was generally reasonably well distributed. Although most areas experienced slightly below normal rainfall in the spring of 2018, good rains early in 2019 replenished soil water reserves to allow for very favourable conditions for the remainder of the growing periods (Figure 4). Rainfall during the winter and spring harvesting months were well below normal enabling efficient harvesting and transporting of cane.

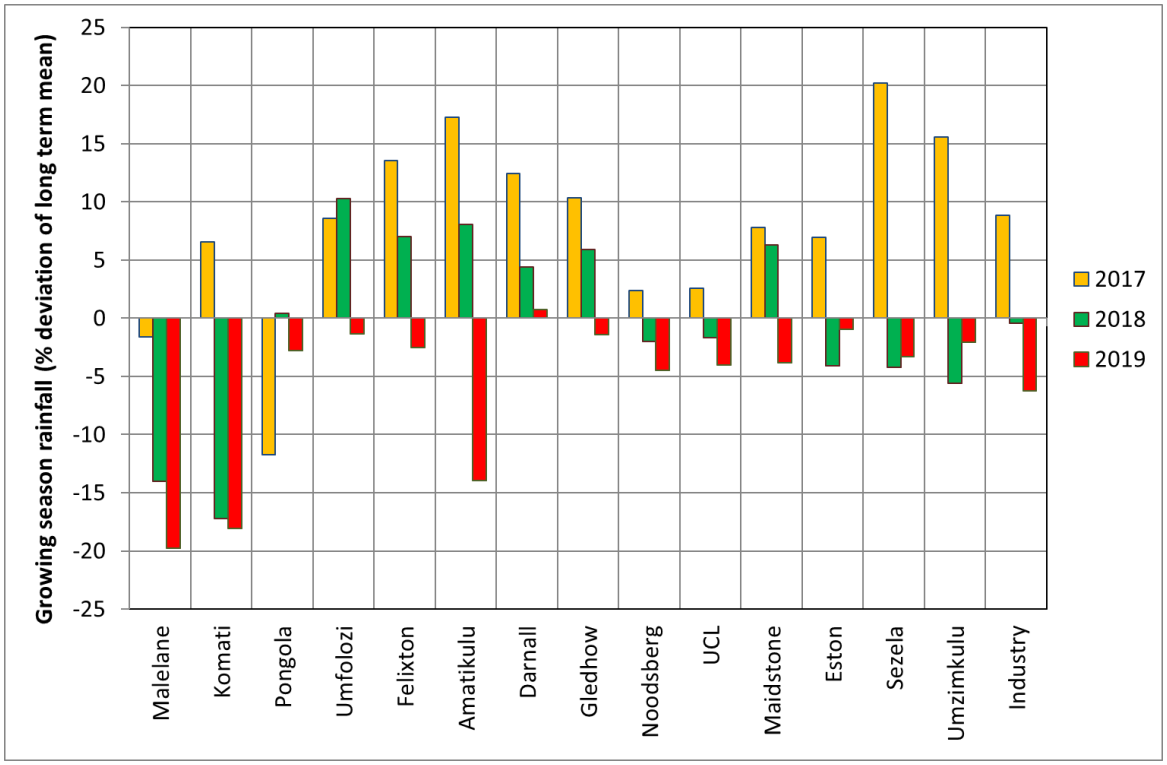

Figure 3. Total 12-month rainfall expressed as a percentage deviation from the long-term mean, averaged over each month of the harvest season for different mill supply areas and the industry as a whole, for the 2019 season compared to the 2017 and 2018 seasons

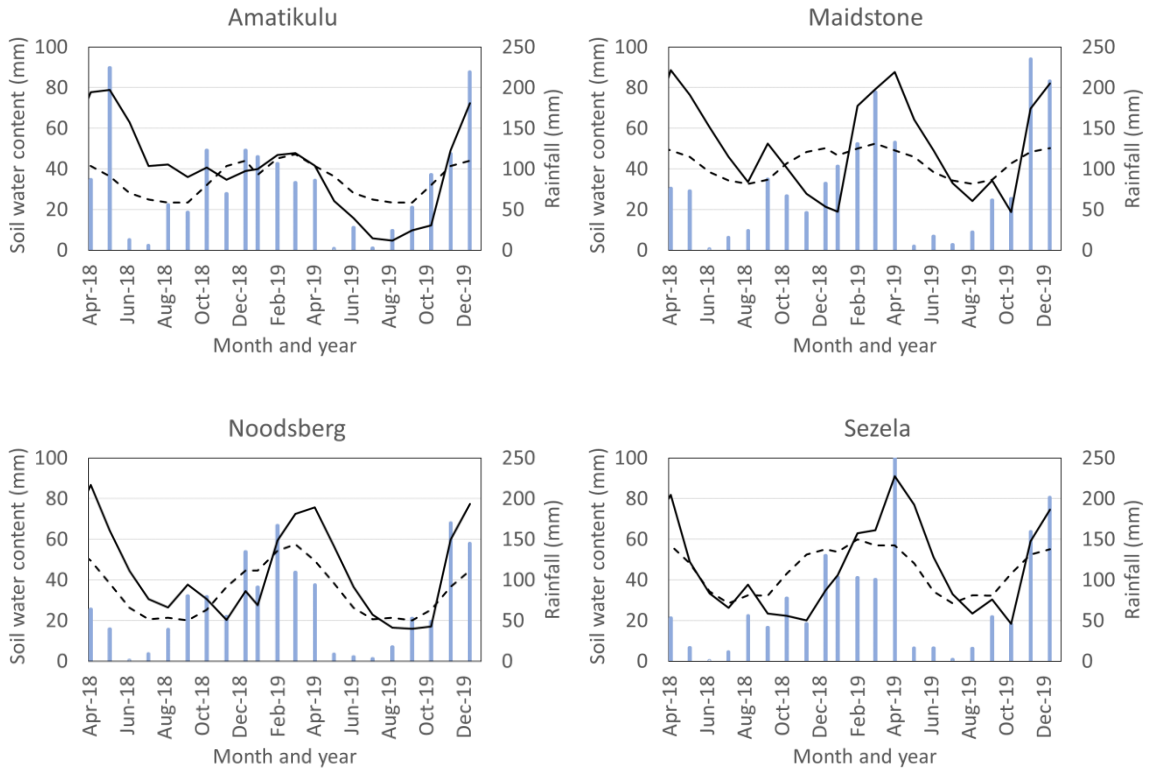

Figure 4. Monthly rainfall (bars) and reference available soil water content (solid line) spatially averaged for different mill supply areas for the period April 2018 to December 2019. The long-term mean reference available soil water content (dashed line) is shown for comparison

Irrigation water supplies in 2019 were mostly adequate and improved slightly from 2018, except for the Crocodile and Umfolozi rivers. Water supply in the Umhlatuze catchment remained very low and inadequate to meet crop demand (Table 1).

Table 1. Growing season average water allocation expressed as a percentage of the full allocation for different water sources for the past three seasons

Mill supply area	**Irrigation water source**	**2017**	**2018**	**2019**
Komati, Malelane	Komati	33	57	66
Malalane, Komati	Crocodile	54	67	59
Pongola	Bivane	57	65	71
Felixton	Umhlatuze	18	27	34
Umfolozi, Felixton, Pongola	Pongolapoort	80	88	97
Umfolozi	Umfolozi	65	80	67

Pests

Eldana

Eldana infestation levels declined further from previous seasons in most rainfed areas (Figure 5), presumably due to improved soil and crop water status in 2018 and 2019 that followed the severe drought in 2016 and 2017. An exception was noted in Pongola where infestation levels rose above the 5 and 15 season means. This long-term build-up in pest numbers in Pongola is attributable to excessive aging of crops in seasons preceding 2019 because of the inability to mill the full crop (pers. comm., M. Adendorff, SASRI).

The industry average infestation levels generally declined further from 2018 and were below the five-season mean. However, the 5 season means exceeded the 15-season mean in the Umfolozi, and Midlands North and South areas. While these differences may not be significant, it might indicate an increase in infestation levels in recent seasons in these areas. The overall trend of the long-term decline in infestation levels in many parts of the industry is encouraging and reflects keen vigilance by the SASRI Biosecurity teams and growers, and increased implementation of integrated pest management strategies (which includes careful targeted application of registered insecticides). Scouting and implementation of robust control measures need to remain a priority going forward.

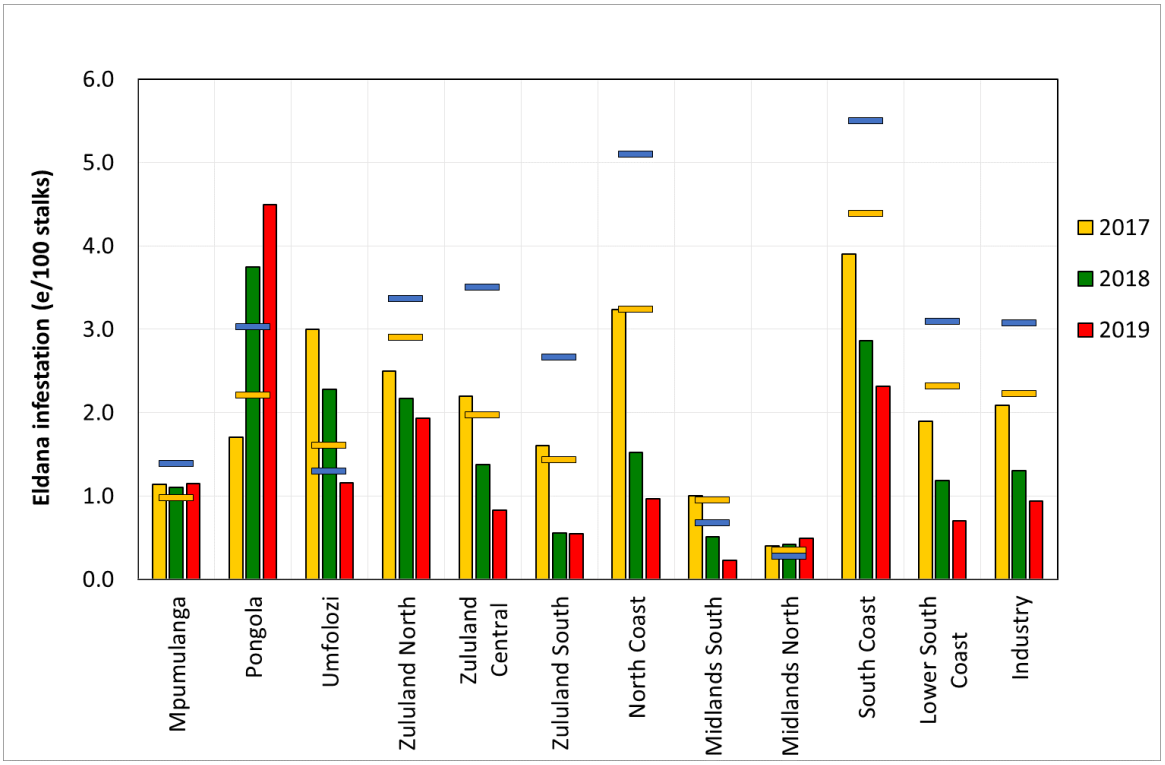

Figure 5. Eldana infestation for different pest and disease areas and for the industry as a whole, for the 2019 season, compared to the 2017 and 2018 seasons and to the long-term mean value over the past five seasons (yellow bar) and 15 seasons (blue bar)

Longhorn beetle

Adult longhorn beetle flights were observed in the Zululand Central area during January and February of 2019. However, far fewer specimens were collected compared to the same period in 2017 and 2018. These flight events seem to occur during hot periods following good rainfall. It also proved more difficult in 2019 than in 2018, to find larvae in the fields that were previously heavily infested, due to the successful eradication of sugarcane stools that provided host material. Larvae were found in sugarcane fields previously planted to eucalyptus. Subsequently, all gum stumps were mechanically removed from problematic fields. An additional 1 140ha planted to sugarcane were issued with destruction orders, bringing the total area destroyed since the start of the outbreak to 2 270ha. Research efforts at SASRI, in collaboration with the Universities of Pretoria and Stellenbosch, are ongoing.

Yellow sugarcane aphid

Yellow Sugarcane Aphid (YSA) now occurs throughout the South African sugar industry. It also occurs in Eswatini, Mozambique, Zimbabwe, and Zambia, where it is particularly problematic. Initial research by SASRI found that plants grown in glasshouses and harvested at 4-5 months of age with 50-60% leaf area damaged by YSA feeding, showed an average yield reduction of 50%. This emphasises the importance of preventing YSA leaf feeding injury in commercial fields from progressing to levels where there is obvious damage, and where yield loss due to increasing aphid populations is likely to be severe (pers. comm., M. Keeping, SASRI).

A SASRI task team is researching the pest's ecology and exploring insecticidal and biological control options. Long-term better management practices for in-field use, which will promote pest management in a more sustainable manner, will be devised from this information.

Diseases

Smut

Smut levels were lower in the industry in the 2019 season than the previous two seasons with 18% of the area surveyed being infected (Figure 6). This was slightly lower than the five season mean of 20%. An average of 0.1% of the stools inspected were infected which is lower than the previous two seasons and the five and ten season means (data not shown). Substantial progress has been made in reducing smut levels in Mpumalanga through routine roguing and mandatory eradication of heavily infected fields. No fields exceeded the permissible level in this area in the 2019 season.

Smut was widespread in Pongola with close to 50% of the area surveyed being infected. While surveys indicated that the disease was less prevalent than the previous two seasons, levels remained higher than the five-season mean. No fields exceeded 10% stools infected which is the level when yield loss can be expected, but 8% of the fields surveyed exceeded the permissible level for the area. Rogueing is increasingly being used to reduce disease incidence within fields in the Pongola area, with 89 rogueing orders (325 ha) being issued. Eradication orders were issued for four N41 and two N19 fields (21 ha) in the area.

The apparent improvement in the smut situation in Umfolozi needs to be confirmed by further surveys. While fields of the smut-susceptible variety NCo376 are targeted for survey in Zululand South (Amatikulu MSA) and levels were high within these fields, this variety is becoming less common in the area. Only 73 ha were available for survey in 2019. Other varieties such as N12, N39 and to a lesser extent N41 contributed to the high smut levels observed. Teams in the Midlands areas focused on seedcane surveys so data for commercial fields were limited. However, growers are being reminded to pay particular attention to their N54 fields with increasing levels of smut being observed in this variety.

Mosaic

Mosaic levels remained low in most parts of the industry with an overall mean of 0.5% of the area surveyed being infected (data not shown). The disease was observed in less than 0.01% of the stools inspected. No fields exceeded the permissible level set for each area. An accurate indication of mosaic incidence in the Midlands areas is however not possible given the limited number of surveys conducted in commercial fields.

Ratoon stunt (RSD)

RSD incidence in the industry was similar to that of the previous season and lower than the five and ten season means (Figure 7). Levels were highest in Umfolozi with 15% of the fields testing positive. This was higher than the ten-season mean. RSD was detected in over 10% of the fields sampled in the Midlands South area. These fields were all due for eradication and long fallow periods were recommended.

Rust

Orange rust spores were detected on traps between August and December 2018 but have not been detected since. No orange rust symptoms have as yet been observed on cane in South Africa. The disease was reported for the first time in Mauritius in March 2018 and Reunion

Island in July 2018. Mild brown rust symptoms were observed on a wide range of varieties on the coast and high lying areas. Severe symptoms were reported on N42 and moderate to severe infections were observed on N39. Brown rust is becoming increasingly common in summer, and moderate to severe infections are no longer limited to autumn and spring. Tawny rust was less common and severe in most parts of the industry compared to the previous season. Registered fungicides are available to manage the different rusts in the industry, including orange rust should it be observed.

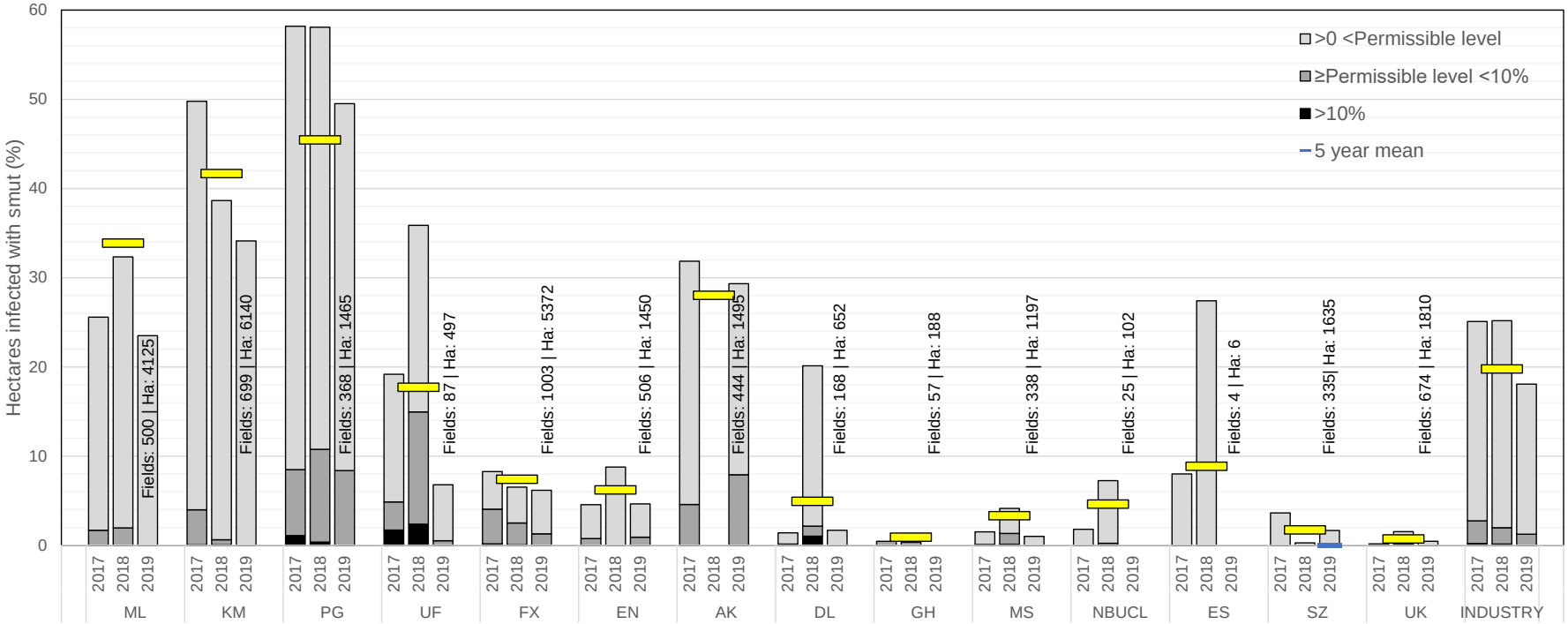

Figure 6. Percentage area surveyed infected with smut at three different levels, as recorded from June 2018 to May 2019 (2019) in the different pest and disease/mill supply areas (ML = Malelane, KM = Komatipoort, PG = Pongola, UF = Umfolozi, FX = Felixton, EN = Entumeni, AK = Amatikulu, DL = Darnall, GH = Gledhow, MS = Maidstone, NBUCL = Noodsberg/Union Coop Limited, ES = Eston, SZ = Sezela, and UK = Umzimkulu), and for the industry as a whole, compared to that for the corresponding periods in the 2017 and 2018 seasons. The five-season mean for smut infected area (% of surveyed area) is also shown (yellow horizontal bars). (PL- area specific permissible level: Mpumalanga - 4%; Pongola - 2%; all other areas - 1%)

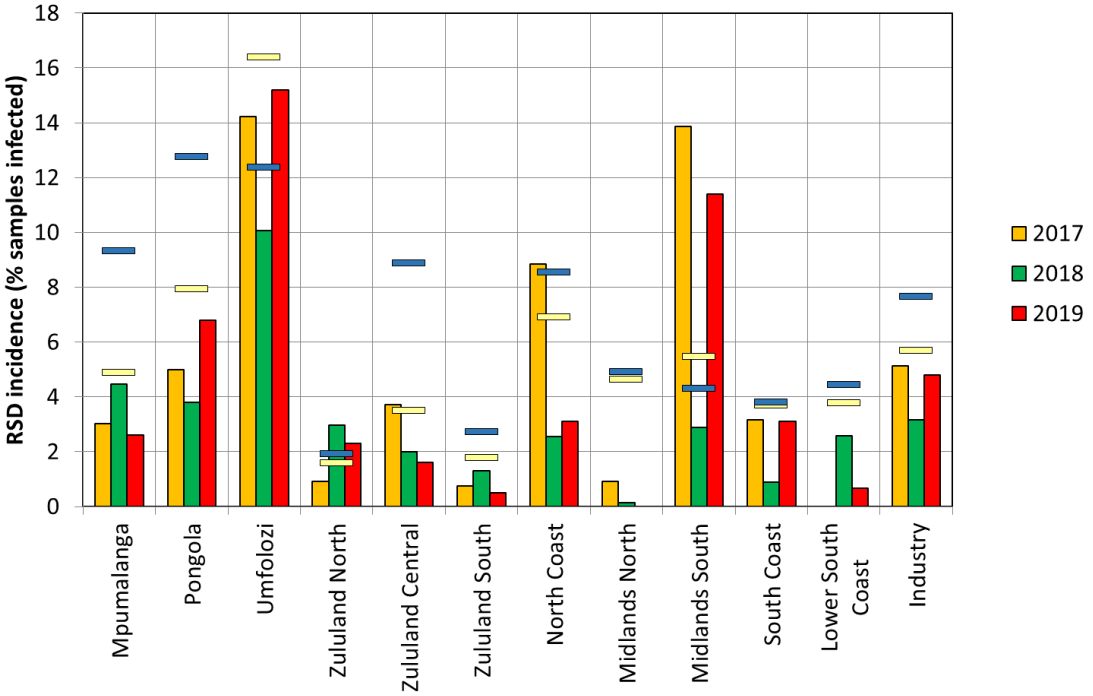

Figure 7. Ratoon stunt (RSD) incidence for different pest and disease areas and for the industry as a whole, for the period June 2018 to May 2019 (2019) compared to that of the corresponding periods for the 2017 and 2018 seasons. The mean values over the past five (yellow horizontal bars) and ten seasons (blue horizontal bars) are also shown

Cane yield and quality

Average cane yields (Figure 8) in the northern irrigated MSAs declined slightly from the very high yields achieved in 2018, but remained above the five season mean. Possible reasons for the decline could be the widespread and prolific flowering[1] (pers. comm., M. Adendorff, SASRI), reduced soil water supply from the Crocodile system (Table 1), and damage caused by high Eldana levels in Pongola (Figure 5).

Yields were also slightly lower, but above the five-season mean, for MSAs in Zululand, North Coast and Midlands North areas, and for the industry as a whole. Small increases in yield from 2018 occurred for the Umfolozi and Umzimkulu MSAs. Widespread flowering in coastal areas may have limited yields somewhat in these areas.

[1] The SASRI Weather Web flowering index shows that warm temperatures during the flower initiation period in March 2019 provide a strong induction signal for flowering in all irrigated areas.

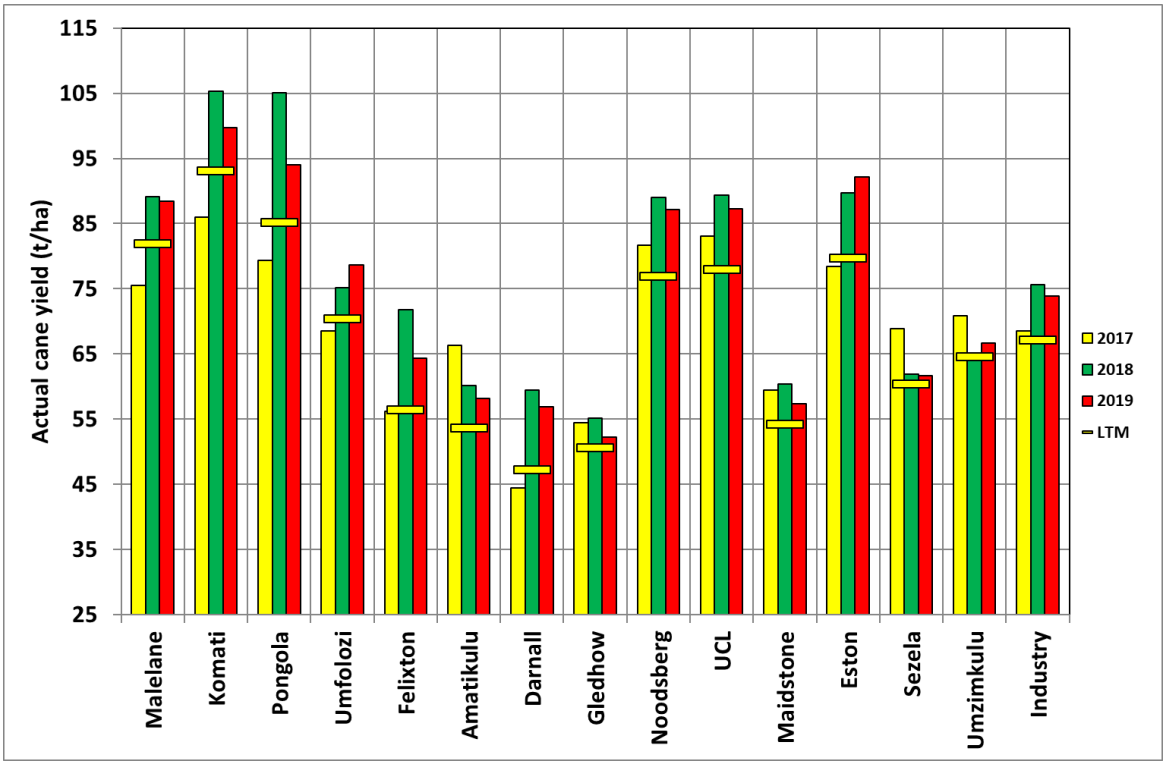

Figure 8. Average cane yields in the 2019 season for different mill supply areas and for the industry as a whole, compared to the 2017 and 2018 seasons and the five-season mean yield (LTM), shown as yellow horizontal bars

Cane quality information, quantified as the estimated recoverable crystal (ERC) content of cane (fresh mass basis), are illustrated in Figure 9. Seasonal average ERC for the Mpumalanga MSAs declined slightly from 2018 and fell below the five-season mean. These areas received significant rain after mill opening that may have (1) interfered with preparing cane for harvesting through drying off, and (2) caused disruptions to harvesting and transport operations. Rainfall after mill opening and Eldana damage in carry over cane also suppressed early season cane quality for Pongola, although the seasonal average improved from the low level of 2018.

Cane quality improved markedly from 2018 for Zululand and most North Coast MSAs and exceeded the five season means (Figure 10). South Coast MSA also achieved excellent cane quality, well above the five-season mean, albeit not as good as in 2018. The excellent quality achieved in rainfed coastal areas can be ascribed to a combination of factors.

Favourable growing conditions during the months leading up to the harvesting period promoted the use and efficacy of chemical ripening of early season cane in many areas (van Heerden and Ramusandiwa, 2019). Relatively dry weather that persisted for most of the harvesting period further promoted natural ripening and allowed effective harvesting and transport of crops throughout the season. In addition, widespread flowering in coastal areas promoted natural ripening of cane.

Cane quality in the Midlands MSAs declined from that in 2018 to below the five-season mean. This is ascribed to cane growing actively at the start of the milling season due to good late summer rainfall, combined with the fact that little chemical ripening was possible (pers. comm., D. Wilkinson, SASRI). In addition, the rapid growth of new varieties (N48, N50, N52, N54 and N61) necessitated early harvesting of relatively immature crops (pers. comm., D. Wilkinson, P Botha, SASRI). Significant rain after mills opened also interfered with harvesting operations, causing a decline in cane quality in the first part of the milling season.

The industry average ERC content was 11.5%, equal to the value achieved in 2018 (Figure 9).

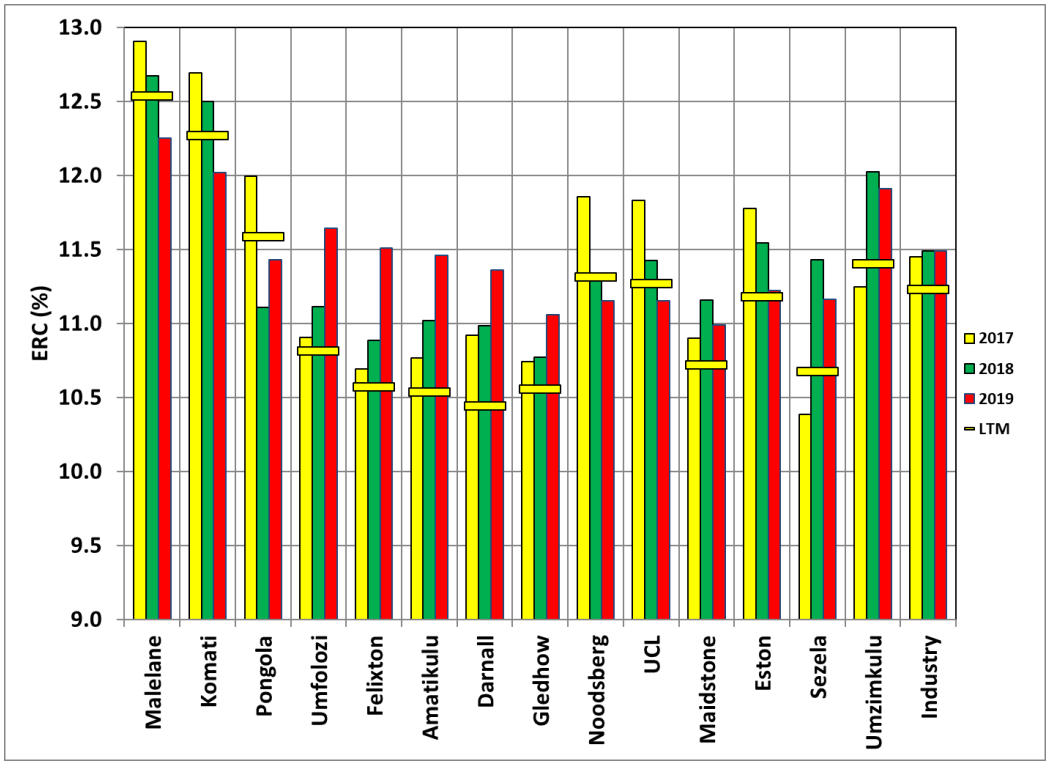

Figure 9. Estimated Recoverable Crystal content of cane (ERC%) on a fresh mass basis for different mill supply areas and for the industry as a whole, for the 2019 season, compared to the 2017 and 2018 seasons and the five-season mean (LTM), shown as yellow horizontal bars

Industry and farm economics

Local sugar consumption increased by 10% (108 486 tons) from 2018. The main driver of this increase was a 72% (98 807 tons) reduction in deep sea imports, due to more effective import tariff protection. Local demand also responded positively to Department of Trade and Industry led efforts through the Sugar Industry Master Plan to persuade retailers and manufacturers to use and buy SA sugar only. This was mainly in response to the disruptive effects that the Health Promotion Levy and increased imported sugar from Eswatini had on local demand in the 2018 and 2019 seasons.

Together with the increased local market sales, the higher world sugar prices and weaker R/US$ exchange rate resulted in a higher average export revenue per ton sugar compared to the 2018 season, which helped realise a 18% increase in the Recoverable Value (RV) price (RV - Recoverable Value is a measure of sugarcane productivity for which growers get paid in South Africa (Groom, 1999)) (Table 2).

The large increase in the RV price, combined with relatively low increases in costs, lifted net farm income (NFI) of typical large scale rainfed farms to positive levels in 2019 (Table 3). NFI for typical large-scale irrigated farms also increased to more sustainable levels. Higher NFI combined with good yields would have enabled many large-scale operations to recover some of the losses incurred in recent seasons.

Table 2. Key economic indicators for the South African sugar industry (SACGA, 2019a)

Season	**2018**	**2019**
Gross sugar production (t)	2 193 321	2 227 229
Local market demand (t)	1 140 990	1 249 476
Sugar imports (t) (Apr to Feb)	138 155	39 348
Sugar exports (t)	1 042 831	967 579
#11 World price (USc/lb.)	12.52	12.99
Currency exchange rate (R/US$)	14.02	14.88
World sugar price (R/t)	4016.85	4262.07
RV price (R/t)	3 574.41	4 220.58

Similar trends were observed for the small-scale sector, although NFI levels are generally lower than those of typical large-scale enterprises due to lower cane income (lower yields and poorer cane quality), and much higher operating costs caused by diseconomies of scale. Additional income derived from the Supplementary Payment Fund (de Ridder, 2014), the Value Added Tax rebate (SACGA, 2019d) and the recently instituted Transformation Intervention Fund (Dlamini *et al.*, 2019) only partially compensated for this difference. NFI for rainfed small scale farms was very low and cannot be sustained in the long term. Irrigated small scale farms were better off. The profitability of the small-scale sector could be further improved by building on efforts to contain contracting costs and to reduce the RV yield gap.

Table 3. Gross income, operating costs and net farm income (defined as the difference between gross income and total operational cost, and excluding managerial costs, interest, rent and leases, depreciation, and tax) per ton of cane harvested for typical rainfed and irrigated large-scale and small-scale farms for different seasons (derived from SACGA, 2019b, 2019c).

	Rainfed			**Irrigated**		
Season	**2017**	**2018**	**2019**	**2017**	**2018**	**2019**
Large-scale farms						
Gross income	545.29	439.24	530.95	551.91	477.13	549.10
Total operating costs	434.58	467.14	483.86	382.58	372.41	394.11
Net farm income	110.71	-27.90	47.09	169.33	104.72	154.99
Small-scale farms						
Gross income	560.47	541.08	617.36	651.32	618.66	708.95
Income from cane sales	479.01	408.87	482.84	569.66	486.25	574.21
VAT* Rebate	44.12	47.00	49.35	44.12	47.00	49.35
Supplementary payment fund income	37.34	39.21	41.17	37.54	39.42	41.39
Transformation intervention fund income	0.00	46.00	44.00	0.00	46.00	44.00
Total operating costs	505.00	565.74	612.04	518.24	575.03	620.35
Net farm income	49.65	-24.66	5.32	85.21	43.64	88.61

*VAT – Value added tax

Conclusion

Generally, excellent cane yields were achieved in 2019, similar to, or slightly below the very high yields achieved in 2018. Although total rainfall was generally slightly below normal it was well distributed, enabling good growing conditions during summer and ideal harvesting conditions for most of the winter harvesting period. Cane quality was hampered slightly by early season rainfall in Mpumalanga and Midlands MSAs. Early harvest of highly productive but immature cane of newer varieties in the Midlands will require improved crop management to optimize RV yields. Cane quality in other MSAs was excellent and much improved from 2018.

Overall, Eldana seems to be well controlled, although infestation levels remained very high in Pongola after the long-term build-up in excessively aged crops. Although improved milling efficiency allowed for the entire crop to be harvested in 2019, control measures will have to be intensified to reduce infestation levels. Continued surveillance for YSA is imperative to contain infestation levels and limit crop damage.

Overall smut levels were down from 2018, but efforts to reduce incidence remain a priority in the northern irrigated areas, particularly Pongola. RSD incidence was high in Umfolozi and was common in fields due for eradication in the Midlands South area. Brown rust was common on certain varieties in the rainfed areas. Continued vigilance is required to identify potential outbreaks of orange rust timeously and to manage the situation effectively.

Reduced sugar imports and a slight improvement in local demand for sugar in 2019 enabled a 18% increase in the RV price. This increased typical net farm income per ton of cane for all grower types to positive levels after the heavy losses incurred in 2018. Irrigated farms were better off than rainfed farms in 2019/20, while the sustainability of small-scale farms remains precarious.

Acknowledgements

The authors gratefully acknowledge (1) cane production data supplied by SASA Industry Affairs and Cane Testing Service, (2) field information supplied by SASRI Extension specialists, (3) pest and disease data supplied by SASRI Biosecurity staff, and (4) Ingrid Thompson for her assistance with mapping.

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