

# SUMMARY OF AGRICULTURAL DATA: SUGARCANE CROP 1965

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## Introduction

The last Annual Summary of Agricultural Data for the Sugarcane Crop 1958-59 appeared in the Proceedings of the Thirty-fifth Annual Congress of the South African Sugar Technologists' Association of 1961. The data discussed were very largely obtained from the Special Census of Sugarcane Plantations 1958-59, supplemented by information obtained from Survey of Cane Production by the Sugar Industry Central Board. Indeed the Government Census of Sugarcane Plantations was for very many years the only source of information available for this summary. In recent years, surveys by the Central Board have gradually assumed greater importance as a source of information. They have enabled us to calculate the yield for the various groups which make up the industry including European growers, European Miller-cum-Planters, Indian growers and Bantu growers. They also provided data on acreage under irrigation but unfortunately no information has been obtained on the use of varieties, the proportion of plant and ratoon crops, or the age of the crop at harvest. These items had to be extracted from returns from the government census and as a result the information was somewhat dated by the time it became available to the industry. The two sources of information were supplementary but also a little confusing where they dealt with the same data, e.g. total yield per acre and where the results did not always agree.

During 1965 it was decided to extend the scope of the Central Board surveys so that they would provide not only all the data needed for this report but also pertinent information for use by the Mechanisation Committee. In order to expedite returns and at the same time ensure greater accuracy enumerators were appointed to collect data and to assist where necessary.

As a result of this action we now have for use relevant agricultural data obtained by the industry itself for its own use. This means that the data can be processed quickly and while still of interest to the industry.

## Total Areas and Yields

The Sugar Industry Central Board Survey of Cane Production 1964 to 1967 CB 46/19 shows on the 1st May, 1965, an estimated 833,328 acres were under cane, 376,075 acres of which were scheduled to be cut during the 1965/66 season. The exceptionally low percentage area to be cut reflects the expansion that is now in progress, but it must also be borne in mind that area under cane includes fallow land which thus inflates the area under cane. The following figures reflect the actual situation during the two years before 1965 and provide estimates for two years hence.

Total area under cane—1st May		Area to be harvested		% Area harvested
1963	616,900	1963/64	299,084	48.5
1964	719,689	1964/65	328,300	45.6
1965	833,328	1965/66	376,075	45.1
1966	845,994	1966/67	481,658	56.9
1967	846,318	1967/68	487,969	57.7

These figures reveal clearly the tremendous expansion within the industry during the years 1964 and 1965 and the marked manner in which the corresponding percentage area harvested was depressed. It is interesting to note further that during period 1966 to 1967, and here only estimates are now available, the expansion is likely to level off while the percentage area harvested is expected to reach unprecedented levels which indicate, apart from the necessary readjustment after a period of expansion, an apparent expected fall in the age of the cane at harvest.

At the time when this survey was conducted, the duration and the effect of the drought which was then only beginning to be felt, could not be foreseen and consequently the estimated yield for the 1965/66 season was unrealistic and will not be considered here. Neither would it serve a useful purpose to enumerate estimated yields for future years. However, when it comes to yields obtained in the past there is no reason to doubt the accuracy of the average figure as revealed in this and earlier surveys. The average yield for the industry was 35.8 tons cane per acre for the 1964/65 season and 36.6 tons cane per acre for the 1963/64 season.

## Rainfall and Yield

In South Africa the yield of cane is of course extremely sensitive to rainfall and rainfall distribution.

The following table provides a comparison of yields of cane as recorded in Central Board surveys and average rainfall data as compiled by the Experiment Station from 54 centres scattered throughout the sugar belt.

YIELD OF CANE PER ACRE		RAINFALL FOR YEAR ENDING 31ST MAY	
Season	Yield	Rainfall	Year ending 31st May
1959/60	32.4	33.34	1959
1960/61	33.8	35.66	1960
1961/62	39.4	46.43	1961
1962/63	37.8	34.10	1962
1963/64	36.6	38.32	1963
1964/65	35.8	40.92	1964
1965/66	—	29.02	1965

The rainfall for the year ending the 31st May, 1965, was only 29.02 inches compared with a 41 years' computed mean of 38.20 inches. The drought was in fact very much worse than is suggested by these annual figures. Thus it is known that some 75 per cent of our annual cane growth takes place during the six months from November to April and during this period only 14.68 inches of rain fell compared with a mean figure of 26.05. Evaporation at this time was very high being 34.56 inches compared with a mean of 28.92 inches. This disastrous drought must depress the yield for the 1965/66 season very greatly.

### Irrigation

Of the 833,328 acres under cane on the 1st May, 1965, 98,754 acres or 11.9 per cent are under irrigation. Although the area under irrigation has expanded considerably during recent years, the percentage area irrigated has not altered a great deal.

Year	Area under cane	Area under irrigation	Per cent area under irrigation
1963	616,900	75,488	12.2
1964	719,689	84,722	11.8
1965	833,328	98,754	11.9
1966*	845,994	103,146	12.2
1967*	846,318	103,556	12.6

\* Estimates.

The estimates here given do not include the sugar areas of the Eastern Transvaal which are now being developed and which will be entirely under irrigation. They do, however, cover areas such as Pongola where cane cannot be grown without irrigation and also areas where supplementary irrigation is practiced. The following table indicates the main areas being irrigated during 1965.

Area or Mill Co.	Acres under irrigation	Per cent area total	Per cent of Industrial total
Whole industry . . . . .	98,754	11.9	100.0
Pongola . . . . .	21,062	98	21.3
Umfoloji . . . . .	13,744	26	13.9
Empangeni . . . . .	10,110	19	10.2
Nkwalemi . . . . .	11,783	96	11.9
Glendale . . . . .	2,080	15	2.1
Gledhow . . . . .	3,045	11	3.1
Tonga . . . . .	7,909	10	8.0
Mount Edgecombe . . . . .	12,722	21	12.9
Hulett Group excluding Mt. Edgecombe . . . . .	9,512	6	9.6
Illovo . . . . .	2,977	4	3.0

### Burning and Trashing

Although the areas of cane burned or trashed are not readily available from this survey, growers did indicate to what extent trashing was practised on individual farms and for the purpose of this report a grower who practises trashing to the extent of more than 50 per cent will be classified as one who trashes. Thus it was found that for the industry as a whole,

858 growers out of 1,535 stated that they burned or intended to burn crops which were to be ratooned. The remaining 678 trashed these crops. We can therefore conclude that 56 per cent of the individuals burned crops which were to be further ratooned while 44 per cent trashed these crops. These figures include between 250 and 300 returns from Jaagbaan and Union Co-operative growers whose cane is mostly in the plant crop stage. If we subtract these from the returns, the percentage of growers practising burning falls to 47 per cent. It is perhaps reasonable to conclude that about half the growers burn and half trash crops which are to be ratooned.

When it comes to crops to be ploughed out after cutting, i.e. not intended for further ratooning, burning is far more general. Here some 85 per cent of the returns showed that burning is practised. In fact burning of crops to be ploughed out predominates in all major subdivisions of the industry.

There is, however, no such general practice for crops intended for further ratooning. In the coastal areas of the North Coast, only 14 per cent of growers indicated that they burned, whereas in the Jaagbaan and Union Co-op. areas over 96 per cent of the growers intend burning crops for further ratooning. The following table gives some pertinent data for these crops.

### Percentage burned before ratooning

Whole Industry . . . . .	47 - 56
Jaagbaan-Union Co-op. . . . .	96
Pongola . . . . .	90
Umfoloji . . . . .	82
Nkwalemi . . . . .	85
North Coast (Coastal below 1,000 ft.) . . . . .	14
North Coast (Inland above 1,000 ft. but excluding Jaagbaan-Union Co-op. . . . .	21
Zululand (Excluding Umfolozi and Nkwalemi) . . . . .	29
South Coast (Coastal below 1,000 ft. excluding Umzimkulu) . . . . .	28
South Coast (Umzimkulu) . . . . .	49

It is clear therefore that there are very large differences in the treatment of crops which are to be ratooned and as a rule there are sound reasons for trashing or burning. Burning is obviously preferred in areas of low temperatures and where there may be a frost hazard: Jaagbaan-Union Co-op. and Pongola. It is also commonly practised in areas regularly irrigated: Pongola and Nkwalemi. Similarly burning is preferred on the Umfolozi flats because of the existence of a high water table and trash can also be troublesome in case of floods. On the other hand, where temperatures are not so critical but moisture conservation is, a trash blanket can be most valuable and consequently trashing predominates on the coastal non-irrigated areas of Zululand, the North Coast and

on the South Coast. Even on inland areas of the North Coast (excluding Jaagbaan-Union Co-op.) and in Ntumeni in Zululand, trashing predominates. The fact that Umzimkulu practises more burning than is normal at that altitude, is probably due to low temperatures prevailing at this, the southern extremity of the sugar belt.

### Fertiliser Usage

The survey reveals that the sugar industry used approximately a quarter of a million tons of fertiliser for the year ending 30th April, 1965, the average amount of fertiliser applied per acre under cane being 700 lbs. Where the approximate age of the crop at harvest is 18 months it means that an individual crop receives on average rather more than a 1,000 lbs. of fertiliser per acre.

The following table reflects some details of fertiliser usage in the industry and the yield of ratoon cane per acre per month is also given.

	Lbs. fertiliser used per acre under cane	Yield of ratoons T.C.A. per month
South Coast . . . . .	814	1.62
Midlands . . . . .	874	1.47
North Coast . . . . .	636	1.83
Zululand . . . . .	624	1.98
Pongola . . . . .	1,194	2.79

The term "Midlands" refers here to the Jaagbaan and Union Co-operative growers, as well as growers delivering cane to Illovo and Mount Edgecombe mills but where the cane is grown at an altitude higher than 1,000 feet. This area therefore covers some inland areas of both the South and the North Coast and has a lot in common in terms of temperatures, rainfall, etc. In fact this area appears in many respects quite distinct (e.g. varieties, burning and trashing) from other high altitude areas such as Upper Tongaat or Ntumeni.

The table reveals that the most productive area Pongola also uses the largest quantity of fertiliser per area under cane although not per unit of cane production. The relatively high yield is of course mainly the result of irrigation and favourable temperatures.

The relatively low amount of fertiliser used in the Zululand area is partly the result of understandably low applications on the fertile alluvial flats of Umfolozi, and the somewhat more surprisingly, low applications at Nkwaleni.

In the following table fertiliser usage and yield for these two districts are compared with those of Ntumeni, as well as with the production from Umzimkulu which is the southern limit of cane production. Ntumeni is of course a high altitude area and in the case of Umzimkulu the coastal (below 1,000 ft.) and high altitude (above 1,000 ft.) areas have been separated. Data are also provided for all the areas in this high altitude group but excluding the Midlands. It is clear

that high altitude areas are using fertiliser liberally and getting good yields.

	Lbs. fertiliser used per acre under cane	Yield of ratoons T.C.A. per month
Umfolozi . . . . .	480	2.65
Nkwaleni . . . . .	504	2.63
Ntumeni . . . . .	786	1.86
Umzimkulu (Coastal)	640	1.60
Umzimkulu (High alt.)	1,170	1.95
High altitude all areas except the Midlands	856	1.84

The survey reveals vast differences in fertiliser practice between individuals in the same area. There are growers who use adequate or perhaps even excessive quantities of fertiliser but there are those also who still use far too little fertiliser.

Although only the total amount of fertiliser used was asked for in this survey, data obtained from the Fertiliser Society of South Africa show that nearly 1 lb. of P was applied for each ton of cane cut during the 1964 season and that the ratio of N:P:K was about 3.5:1:3.5.

### Varieties

Trends in the changing use of varieties are probably best studied by comparing the varieties to be ploughed out with those being planted or in the absence of these data comparing the varietal position of areas under plant cane and ratoons.

In the following table the percentage area under different varieties expressed in terms of total cane, plant cane and ratoon cane is given for the main divisions of the industry.

It is obvious from this table that the newer varieties N:Co.376, N:Co.382 and N.50/211 are gaining ground rapidly while the old varieties Co.331 and N:Co.310 have lost much of their former popularity. This, however, is not the case with N:Co.310 at Pongola where this variety forms 93 per cent of all plant cane nor is it to a lesser extent in the Midlands where Co.331 forms 13.4 per cent of all plant cane. In fact over 80 per cent of all Co.331 as plant cane is now found in the Midlands and this variety is now seldom planted elsewhere. N:Co.293 continues to find favour in the high altitude areas and particularly in the Midlands, where it forms about a third of all the plant cane. N:Co.339 is now disappearing fast and the varieties N:Co.292 and N:Co.334 never really took on in the industry. N:Co.376 is now the most widely planted variety and seems to do well under the most varied conditions. It seems, however, to be favoured mainly on the South Coast where it constitutes 78 per cent of the area under plant cane.

## PERCENTAGE AREA UNDER

	Co.331			N:Co.310			N:Co.339			N:Co.293			N:Co.292		
	Total P+R	Plant	Rtn.	Total P+R	Plant	Rtn.	Total P+R	Plant	Rtn.	Total P+R	Plant	Rtn.	Total P+R	Plant	Rtn.
South Coast . . . . .	4.6	0.7	8.2	17.4	8.0	26.1	2.6	0.0	4.9	6.2	7.0	5.7	1.3	0.1	2.4
Midlands . . . . .	20.0	13.4	37.3	1.8	1.3	2.8	1.1	0.6	2.6	33.7	32.7	37.5	0.7	0.9	0.2
North Coast . . . . .	4.9	1.5	6.3	22.9	6.8	29.5	3.8	0.6	5.2	4.3	1.7	5.4	1.6	0.1	2.4
Zululand . . . . .	4.5	1.3	5.7	46.6	33.9	53.3	2.3	0.6	3.2	2.9	2.0	3.4	0.3	0.5	1.2
Pongola . . . . .	0.0	0.0	0.0	91.8	93.0	91.4	0.1	0.0	0.1	0.9	0.1	1.2	0.1	0.0	0.2
High altitude* . . . . .	3.0	0.9	4.6	11.4	2.7	18.0	2.7	0.1	4.4	17.9	13.0	22.1	0.9	0.1	1.4
Low altitude† . . . . .	5.0	1.3	6.6	37.7	23.5	44.3	3.0	0.5	4.2	1.1	0.4	1.4	1.2	0.3	1.7
Industry . . . . .	6.8	4.6	8.1	30.6	15.9	39.9	2.5	0.4	3.9	8.2	11.2	6.6	1.1	0.4	1.5

\* Above 1,000 ft. above sea level but excluding Midlands.

The following table based on percentage area of the main varieties established as plant cane shows how far the Midlands differ from the High Altitude area and Pongola from the Low Altitude area.

	PERCENTAGE AREA UNDER PLANT CANE					
	Co.331	N:Co.310	N:Co.293	N:Co.376	N:Co.382	N.50/211
Total Industry . . . . .	4.6	15.9	11.2	45.9	13.7	7.2
High Altitude . . . . .	0.9	2.7	13.0	69.8	3.7	8.5
Midlands . . . . .	13.4	1.3	32.7	29.1	20.7	1.3
Low Altitude . . . . .	1.3	23.5	0.4	49.7	13.3	10.1
Pongola . . . . .	0.0	93.0	0.1	5.1	0.6	0.3

Although it is tempting to analyse the yields obtained from different varieties in these regions, conclusions so drawn are likely to be of little value since the main varieties grown are bound to be rather similar in yield and exceptional yields obtained on small areas must necessarily be discarded as unrepresentative.

#### Plant Cane, Ratoons and Age of Cane

The area under plant cane on the 1st May, 1965, forms an exceptionally high proportion of the total area under cane. This is the result of expansion and bears little or no relation to the number of ratoon crops grown. The expansion was of course greatest in the Midlands area where on the 1st May, 1965, no less than 72.4 per cent of all land under cane was under plant cane. During the year ending 30th April, 1965, the same area however harvested 19.8 per cent of their cane areas as plant cane and 80.2 per cent as ratoons. The comparable results for the whole industry are as follows: 38.7 per cent of the area was under plant cane on the 1st May, 1965, but during the year ending 30th April, 1965, 17.1 per cent of the cane harvested was plant cane and 82.9 per cent ratoon. Not only did rapid expansion take place during the year under review, but there was also a larger than usual replanting programme.

Plant cane expressed as a percentage of the total area under cane on 1st May, 1965.

South Coast . . . . .	48.8
Midlands . . . . .	72.4
North Coast . . . . .	28.9
Zululand . . . . .	31.6
Pongola . . . . .	24.9
High Altitude . . . . .	40.0
Low Altitude . . . . .	31.8
Industry . . . . .	38.7

This survey enables us for the first time to estimate with a fair degree of accuracy the age of cane at harvest. The average for the whole industry for both plant cane and ratoons for the year ending 30th April, 1965, was 18 months. The data reveal a rather surprisingly small age difference between plant cane and ratoons. On the average plant cane outyields ratoons by some 5 to 9 tons cane per acre per harvest or 0.3 to 0.5 tons cane per acre per month.

The following table shows the yields obtained for plant cane and ratoons for our main areas.

**DIFFERENT VARIETIES OF CANE**

N:Co.334			N:Co.376			N:Co.382			N.50/211			Others		
Total P+R	Plant	Rtn.	Total P+R	Plant	Rtn.	Total P+R	Plant	Rtn.	Total P+R	Plant	Rtn.	Total P+R	Plant	Rtn.
0.4	0.3	0.4	62.9	78.0	49.0	2.6	3.4	1.9	1.8	2.4	1.2	0.4	0.1	0.1
0.0	0.0	0.0	25.1	29.1	14.3	16.3	20.7	4.4	1.1	1.3	0.5	0.2	0.0	0.4
0.7	0.4	1.0	46.0	63.4	39.1	6.7	10.8	5.1	8.0	13.8	5.8	1.1	0.9	0.4
0.2	0.2	0.1	27.7	34.8	24.3	8.3	15.6	5.0	5.9	10.5	3.9	0.8	0.6	0.1
0.0	0.0	0.0	6.0	5.1	6.3	0.2	0.6	0.1	0.6	1.0	0.4	0.3	0.3	0.3
0.6	0.8	0.6	52.1	69.8	40.4	3.0	3.7	2.5	6.6	8.5	5.1	1.9	0.4	0.7
0.3	0.2	0.4	37.4	49.7	32.0	7.7	13.3	5.1	6.0	10.1	4.2	0.6	0.6	0.2
0.3	0.2	0.4	36.6	45.9	30.9	8.0	13.7	4.5	5.2	7.2	3.9	0.7	0.4	0.2

† Below 1,000 ft. above sea level but excluding Pongola.

	PLANT CANE			RATOONS			ALL CANE (PLANT AND RATOON)		
	T.C.A.	Age	T.C.A. per month	T.C.A.	Age	T.C.A. per month	T.C.A.	Age	T.C.A. per month
South Coast . . . . .	41.1	21.0	1.96	32.6	20.1	1.62	34.0	20.2	1.68
Midlands . . . . .	37.7	22.8	1.65	32.3	22.0	1.47	33.3	22.2	1.50
North Coast . . . . .	39.6	19.0	2.08	33.3	18.2	1.83	34.4	18.3	1.88
Zululand . . . . .	42.3	17.2	2.46	34.3	17.3	1.98	35.7	17.3	2.06
Pongola . . . . .	61.5	14.0	4.39	39.0	14.0	2.79	41.6	14.0	2.97
High Altitude . . . . .	43.2	18.1	2.39	36.4	19.8	1.84	37.7	19.5	1.93
Low Altitude . . . . .	40.7	18.3	2.22	33.3	17.7	1.88	34.6	17.8	1.94
Industry . . . . .	41.6	18.3	2.27	34.1	17.9	1.91	35.4	18.0	1.97

A summary of the data submitted shows that the highest yields are obtained in the extreme North at Pongola where the average age of the crop is only 14 months and 2.97 tons cane per acre per month were produced during the year 1964/65. The Midlands gave the lowest yields at 33.3 tons of cane per acre at 22.2 months or 1.50 tons cane per acre per month. With the exception of the Midlands, an inland high altitude area covering parts of the South Coast and the North Coast, the yield of cane increased progressively from South to North and the average age at which cane is cut decreased from South to North. Although cane grown in the high altitude area (excluding the Midlands) is on the average older at cutting than cane grown on the coast, there is indeed but little difference in the average yield of cane per acre per month between these two areas.

**General Information**

According to the Sugar Industry Central Board Survey of Cane Production CB 46/19 European growers occupied 581,977 acres out of a total of 833,328 acres under cane on the 1st May, 1965, i.e. European growers were responsible for 69.8 per cent of the area under cane. Their yield 37.8 tons cane per acre was somewhat higher than the average for the industry, 35.5 tons per acre, and European growers produced

69.0 per cent of the 1964/65 crop, indicating that expansion was largest in this sector of the industry.

The following table gives the percentage areas under cane on 1st May, 1965, for the main producing groups and the mean yields obtained by each group for the year 1964/1965.

	Per cent of area under cane on 1st May, 1965	Yield T.C.A. 1964/65 Season
European growers . . . . .	69.8	37.8
Miller-cum-Planter . . . . .	17.9	36.3
Indian growers . . . . .	8.8	25.6
Bantu growers . . . . .	3.5	19.0
Industry . . . . .	100.0	35.8

**Summary**

This report deals with data from the Sugar Industry Central Board Survey of Cane Production CB 46/19 and shows that on the 1st May, 1965, there were 833,328 acres under cane of which 376,075 acres were expected to be cut during the 1965/66 season. This exceptionally low percentage area to be harvested

reflects the rapid expansion within the industry during the preceding year.

Rainfall has a pronounced effect on yield and the disastrous drought during the summer of 1964/65 will severely reduce the 1965/66 crop but this survey was made too early to venture an estimate of the crop.

On the 1st May, 1965, there were 98,754 acres under irrigation in the industry, i.e. about 12 per cent of the total area under cane.

Burning is generally practised where crops are to be ploughed out but when crops are to be ratooned trashing predominates particularly along the main coastal belt. Even for the latter crops, however, burning is preferred where it is very cold, where irrigation is practised, or where there is a high water table.

Fertiliser usage within the industry was heavy during the year under review and amounted to approximately 1,000 lbs. per acre per crop, or an estimated total of about a quarter of a million tons for the whole industry.

N:Co.376 is by far the most popular variety being planted at present and on the South Coast 78 per cent of all plant cane is N:Co.376. At Pongola, however, N:Co.310 still constitutes 93 per cent of plant cane and in the Midlands N:Co.293 remains the most popular variety with 32.7 per cent of all plant cane. Both N:Co.382 and N.50/211 are increasing rapidly in popularity.

The average age at cutting for the season 1964/65 was 18 months with but a small difference in age between plant and ratoon cane. The average yield of cane per acre per month was 2 tons, being highest at Pongola at 2.97 and lowest in the Midlands at 1.50 tons cane per acre per month.

Less than 18 per cent of the area under cane belongs to miller-cum-planter companies while private European growers account for more than 69 per cent. Where the average industrial yield for the season was 35.8 tons cane per acre, that of Bantu growers averaged only 19 and Indian growers 25.6 tons cane per acre.

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**Dr. Cleasby** (in the chair): It surprised me that the average age of cutting in the 1965 season was eighteen months.

**Mr. Wyatt:** Can Mr. du Toit explain the very large drop in yield from plant cane to ratoon cane for Pongola.

**Mr. du Toit:** We were also very surprised and checked our figures thoroughly so unless the returns from the farmers in that somewhat small area were incorrect, which is possible, attention should be paid to decreasing the number of ratoons to avoid this drop in yield.

**Mr. King:** The table for fertiliser usage on page 3 shows the South Coast and Midlands using more than the North Coast and Zululand but this is almost certainly due to the present high proportion of plant cane in those first two areas. When conditions return to normal I think all these areas will be using between 600 and 700 lbs. per acre of fertiliser.

**Mr. Perk:** It is noticeable that the sucrose content of the cane started higher than usual due to premature ripening but then failed to increase. Were maturity tests carried out to determine if the cane was ripe in June and July?

**Mr. du Toit:** Tests were not carried out.