# APPENDIX—SUGARCANE CROP STATISTICS 1945-46

The "Special Census of Sugarcane Plantations, 1945-46—European Planters only" shows that a total quantity of 4,201,699 tons of 2,000 lbs. of cane were sent to the mills. The total quantity received at the mills was 4,607,055 tons, so that 405,356 tons or 8.80 per cent. of the total must have been sent by Indian and Native planters, of which there are about 1,000 Indians and 1,400 Natives. Most of these are thus small growers, but there are a few who produce from 3,000 up to 10,000 tons or more of cane annually.

No figures are available for the area under cane grown by non-Europeans, but if we assume that they gained the same yield of cane per acre as the Europeans the area reaped by them would have been 15,773 acres, making the total for the industry 179,247 acres.

The total area of cane harvested by European planters was 163,474 acres out of a total area under cane of 343,149 acres, or 47.64 per cent. of the total. This area harvested corresponds to an average yield of cane per acre of 25.70 tons, considerably lower than for the two preceding seasons, though considerably better than for any season before 1938, when Uba cane formed 50 per cent. or more of the crop.

This decrease in yield was due to the cumulative effects of the drought cycle extending from November, 1944, the whole of 1945 and 1946 being most disastrous in lack of rainfall, and unfavourable seasonal distribution of what rain there was. The total average annual rainfall from 44 recording stations in the sugarcane growing area in 1945 was less than 32 inches, of which more than half fell in the two months of February and March.

As a result of the extremely low rainfall for the three months ending January, 1945, drought conditions became established in the latter month; they were relieved temporarily by the rains during the next two months, but thereafter there was a drought of unprecedented length and severity, so that cane growth practically ceased in May until about the end of the year. The total rainfall for the four months ending September, 1945, was 1.17 inches, against an average for that period of 6.83 inches; and the total rainfall for the last seven months of 1945 was 6.70 inches, against an average of 18.30 inches.

There can be no doubt that the continued acute shortage of fertilizers also affected the crop yields very adversely.

The depreciation in cane yields was compensated somewhat by the high average sucrose content of cane, which was 14.28 per cent., the highest in the history of the industry. This was no doubt brought about mainly by the drought conditions, and partly also by the increased proportion of high-sucrose cane varieties.

The total number of returns of European planters is this time 700, with a total land area occupied of 761,636 acres, of which 343,149 acres were under cane and 163,474 acres, or 46.74 per cent. of the total harvested during the year under review.

The following table shows the relative size of sugarcane holdings in the three main areas and the proportion under cane and harvested; also the area of virgin soil suitable for sugarcane planting.

| | Number of returns. | Total acreage occupied. | Average per holder. | Total acreage under cane. | Average per holder. |
|---|---|---|---|---|---|
| South Coast ... | 102 | 182,302 | 1,787 | 81,303 | 797 |
| North Coast ... | 213 | 240,606 | 1,130 | 139,129 | 653 |
| Zululand ... ... | 385 | 338,728 | 880 | 122,717 | 319 |
| Totals ... | 700 | 761,636 | 1,090 | 343,149 | 490 |

| | Total acreage harvested. | Average per holder. | Virgin land still available for planting. | Average per holder. |
|---|---|---|---|---|
| South Coast ... | 36,874 | 362 | 18,739 | 184 |
| North Coast ... | 65,891 | 309 | 17,713 | 83 |
| Zululand ... ... | 60,709 | 158 | 48,448 | 126 |
| Totals ... | 163,474 | 234 | 84,900 | 121 |

| | Average yield of cane per acre. | Sucrose per cent. cane. | Per cent. normal rainfall. | Tons sucrose per acre harvested. | Acreage old land ploughed out. | Per cent. given long fallow. |
|---|---|---|---|---|---|---|
| South Coast | 19.59 | 14.62 | 73.39 | 2.86 | 13,759 | 64.6 |
| North Coast | 28.57 | 14.24 | 78.27 | 4.07 | 23,349 | 57.3 |
| Zululand ... | 26.30 | 14.17 | 78.36 | 3.73 | 25,689 | 60.1 |
| Means... | 25.70 | 14.28 | 77.29 | 3.67 | 62.797 | 60.4 |

It is evident from the above that the number of sugarcane holdings on the South Coast is considerably less than in the northern areas, but that the average size of holding and of area under cane and area of cane harvested are all larger than further north.

The South Coast again suffered more than the northern areas in the drought of 1945, which is reflected in the yields. This position should be found to have changed when the 1946-47 crop figures become available, because the drought of 1946 was less severe on the South Coast than on the North Coast, and was most acute in Zululand.

It is of interest to note from the census returns that there are considerable areas of virgin soils suitable for sugarcane cultivation on existing farms, nearly 85,000 acres in all. These areas would be capable of yielding over a million tons of cane per annum and of increasing the average annual production of sugar by about 120,000 tons.

These areas of virgin soil are to be found in every district, but the greater proportions exist in farms in the outer divisions of Hlabisa and Port Shepstone.

6,600 acres of virgin soil were planted during the year ending April, 1946, the greater proportion being in the Durban district, including the Mid-Illovo cane-growing area, and in the Eshowe district.

Nearly 63,000 acres of old cane lands were ploughed out during the season under review, of which over 60 per cent. were given a long fallow. The South Coast districts, especially Port Shepstone and Durban, lead in the proportion given a long fallow, with Mtunzini next in this important matter.

In terms of total yield of cane the Lower Tugela division, as usual, leads with 1,144,887 tons of cane or 27.2 per cent. of the crop, followed by Lower Umfolozi with 741,972 tons or 17.7 per cent., and Inanda with 737,413 tons or 17.6 per cent.

All the South Coast divisions have further diminished their proportion of the crop, as also Mtunzini and Eshowe, the remaining divisions of Inanda, Lower Tugela, Lower Umfolozi and Hlabisa showing slight to moderate increases in their proportions.

Inanda again leads in yield of cane per acre, 32.32 tons, which is much lower, however, than for the two previous crops. Lower Umfolozi comes next with an average of 30.07 tons cane per acre for the crop, no other division reaching the 27-ton mark.

Experiment Station,
South African Sugar Association,
Mount Edgecombe.

The average yield for all districts is 25.70 tons per acre, 3½ less than the previous season and more than 5 tons less than the 1943 crop. The falling off in yield is marked in every district, but greatest in the Umzinto, Durban, Inanda and Eshowe districts, and least in Lower Umfolozi.

"Other varieties," which really means Co.331 at present, gives the highest yield of cane per acre of 34.70 tons for the plant cane crop and 33.13 tons including ratoons, but this is still based on less than 800 acres.

The 4,419 acres of P.O.J.2725 and 2878 come next with an average yield of 32.63 tons over all crops. But of the more widely planted varieties in a wide range of soils and localities, Co.301 again leads in yield with 27.44 tons cane per acre from 31,537 acres, and Co.281 next with 25.63 tons cane per acre from 114,496 acres.

Co.301 now produces over 24 per cent. of the total crop in the central divisions of Durban, Inanda and Lower Tugela; but in all other divisions except Hlabisa, where there is still 16.8 per cent. of P.O.J. canes, Co.281 still forms over 70 per cent. of the crop.

# YIELDS OF CANE HARVESTED BY DISTRICTS (EUROPEAN PLANTERS ONLY).

## COMPILED FROM UNION DEPARTMENT OF CENSUS RETURNS.

| DISTRICT. | YIELD OF CANE IN TONS. | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | **1935.** | **1936.** | **1937.** | **1938.** | **1939.** | **1940.** | **1941.** | **1942.** | **1943.** | **1944.** | **1945.** |
| PORT SHEPSTONE | 59,259 | 56,685 | 75,028 | 74,856 | 89,585 | 81,811 | 43,704 | 84,444 | 97,113 | 79,993 | 57,630 |
| UMZINTO | 553,401 | 564,427 | 692,159 | 663,609 | 744,981 | 733,332 | 457,518 | 582,516 | 682,713 | 728,879 | 528,593 |
| DURBAN AND PINETOWN | 137,805 | 146,676 | 124,109 | 188,183 | 213,958 | 193,938 | 167,970 | 191,737 | 195,923 | 165,164 | 136,253 |
| **Total South of Umgeni River** | 750,465 | 767,788 | 891,296 | 926,648 | 1,048,524 | 1,009,081 | 669,192 | 858,697 | 975,749 | 974,036 | 722,476 |
| Ratio to 1926 (= 100) | 168.3 | 172.2 | 199.9 | 207.9 | 235.2 | 226.3 | 150.1 | 192.6 | 218.9 | 218.5 | 162.1 |
| INANDA | 672,954 | 629,945 | 615,227 | 683,261 | 807,094 | 816,215 | 627,454 | 774,840 | 812,986 | 823,041 | 737,413 |
| LOWER TUGELA | 1,033,633 | 1,184,839 | 1,138,342 | 1,122,528 | 1,285,888 | 1,299,769 | 921,709 | 1,120,740 | 1,331,681 | 1,310,186 | 1,144,887 |
| **Total for North Coast between Umgeni and Tugela Rivers** | 1,706,587 | 1,814,784 | 1,753,569 | 1,805,789 | 2,092,982 | 2,115,984 | 1,549,163 | 1,895,580 | 2,144,667 | 2,133,227 | 1,882,300 |
| Ratio to 1926 (= 100) | 206.1 | 219.1 | 211.7 | 218.0 | 252.7 | 255.5 | 187.1 | 228.9 | 259.0 | 257.6 | 227.3 |
| **Total for Natal South of the Tugela (excluding Zululand)** | 2,457,052 | 2,582,572 | 2,644,865 | 2,732,437 | 3,141,506 | 3,125,065 | 2,218,355 | 2,754,277 | 3,120,416 | 3,107,263 | 2,604,776 |
| Ratio to 1926 (= 100) | 192.9 | 202.7 | 207.6 | 214.5 | 246.6 | 245.3 | 174.1 | 216.2 | 244.9 | 243.9 | 204.5 |
| MTUNZINI | 403,121 | 413,802 | 435,154 | 462,271 | 525,787 | 507,644 | 426,608 | 457,698 | 533,560 | 556,524 | 465,147 |
| ESHOWE | 128,191 | 120,935 | 151,020 | 193,847 | 243,829 | 240,962 | 217,695 | 243,392 | 264,198 | 293,602 | 236,115 |
| LOWER UMFOLOZI | 496,591 | 616,326 | 713,675 | 703,527 | 777,371 | 765,381 | 601,315 | 655,366 | 758,217 | 769,436 | 741,972 |
| HLABISA | 50,529 | 74,276 | 136,249 | 140,794 | 155,775 | 158,176 | 138,416 | 154,945 | 168,982 | 171,555 | 153,689 |
| **Total North of the Tugela (Zululand)** | 1,078,432 | 1,225,339 | 1,436,098 | 1,500,439 | 1,702,762 | 1,672,163 | 1,384,034 | 1,511,401 | 1,724,957 | 1,791,117 | 1,596,923 |
| Ratio to 1926 (= 100) | 118.7 | 134.8 | 158.0 | 165.1 | 187.4 | 184.0 | 152.3 | 166.3 | 189.8 | 197.1 | 175.7 |
| **GRAND TOTAL FOR NATAL (including Zululand)** | 3,535,484 | 3,807,911 | 4,080,963 | 4,232,876 | 4,844,268 | 4,797,228 | 3,602,389 | 4,265,678 | 4,845,373 | 4,898,380 | 4,201,699 |
| Ratio to 1926 (= 100) | 162.0 | 174.5 | 187.0 | 193.9 | 221.9 | 219.8 | 165.0 | 195.4 | 222.0 | 224.4 | 192.5 |

# YIELDS OF CANE HARVESTED BY DISTRICTS (EUROPEAN PLANTERS ONLY).

## COMPILED FROM UNION DEPARTMENT OF CENSUS RETURNS.

| DISTRICT. | PER CENT. OF TOTAL TONNAGE. | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1933. | 1934. | 1935. | 1936. | 1937. | 1938. | 1939. | 1940. | 1941. | 1942. | 1943. | 1944. | 1945. |
| PORT SHEPSTONE | 2.0 | 1.9 | 1.7 | 1.5 | 1.8 | 1.8 | 1.8 | 1.7 | 1.2 | 2.0 | 2.0 | 1.6 | 1.3 |
| UMZINTO | 18.3 | 17.0 | 15.6 | 14.8 | 17.0 | 15.7 | 15.4 | 15.3 | 12.7 | 13.7 | 14.1 | 14.9 | 12.6 |
| DURBAN AND PINETOWN | 4.2 | 5.1 | 3.9 | 3.9 | 3.0 | 4.4 | 4.4 | 4.0 | 4.7 | 4.5 | 4.0 | 3.4 | 3.2 |
| **Total South of Umgeni River** | 24.5 | 24.0 | 21.2 | 20.2 | 21.8 | 21.9 | 21.6 | 21.0 | 18.6 | 20.1 | 20.1 | 19.9 | 17.2 |
| INANDA | 15.4 | 17.2 | 19.0 | 16.5 | 15.1 | 16.2 | 16.7 | 17.0 | 17.4 | 18.2 | 16.8 | 16.8 | 17.6 |
| LOWER TUGELA | 25.3 | 28.2 | 29.2 | 31.1 | 27.9 | 26.5 | 26.5 | 27.1 | 25.6 | 26.3 | 27.5 | 26.7 | 27.2 |
| **Total for North Coast between Umgeni and Tugela Rivers** | 40.8 | 45.4 | 48.3 | 47.6 | 43.0 | 42.7 | 43.2 | 44.1 | 43.0 | 44.4 | 44.3 | 43.5 | 44.8 |
| **Total for Natal South of the Tugela (excluding Zululand)** | 65.2 | 69.4 | 69.5 | 67.8 | 64.8 | 64.6 | 64.8 | 65.1 | 61.6 | 64.6 | 64.4 | 63.4 | 62.0 |
| MTUNZINI | 10.8 | 11.6 | 11.4 | 10.9 | 10.7 | 10.9 | 10.9 | 10.6 | 11.8 | 10.7 | 11.0 | 11.4 | 11.1 |
| ESHOWE | 3.7 | 3.6 | 3.6 | 3.2 | 3.7 | 4.6 | 5.0 | 5.0 | 6.0 | 5.7 | 5.5 | 6.0 | 5.6 |
| LOWER UMFOLOZI | 17.8 | 13.6 | 14.1 | 16.2 | 17.5 | 16.6 | 16.0 | 16.0 | 16.7 | 15.4 | 15.6 | 15.7 | 17.7 |
| HLABISA | 2.5 | 1.8 | 1.4 | 1.9 | 3.3 | 3.3 | 3.2 | 3.3 | 3.8 | 3.6 | 3.5 | 3.5 | 3.7 |
| **Total North of the Tugela (Zululand)** | 34.8 | 30.6 | 30.5 | 32.2 | 35.2 | 35.4 | 35.1 | 34.9 | 38.4 | 35.4 | 35.6 | 36.6 | 38.0 |
| **GRAND TOTAL FOR NATAL (including Zululand)** | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

# YIELDS OF CANE HARVESTED BY DISTRICTS (EUROPEAN PLANTERS ONLY).

## COMPILED FROM UNION DEPARTMENT OF CENSUS RETURNS.

| DISTRICT. | TONS CANE PER ACRE. | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **1933.** | **1934.** | **1935.** | **1936.** | **1937.** | **1938.** | **1939.** | **1940.** | **1941.** | **1942.** | **1943.** | **1944.** | **1945.** |
| PORT SHEPSTONE.. .. .. .. .. .. | 20.47 | 16.34 | 14.78 | 13.51 | 21.53 | 29.33 | 26.52 | 18.15 | 13.73 | 23.08 | 31.32 | 22.95 | 19.18 |
| UMZINTO .. .. .. .. .. .. .. .. | 21.68 | 20.69 | 18.20 | 18.22 | 22.41 | 23.50 | 25.94 | 23.02 | 16.47 | 20.20 | 24.68 | 24.18 | 19.51 |
| DURBAN AND PINETOWN .. .. .. .. | 23.00 | 23.34 | 20.27 | 19.77 | 20.42 | 27.65 | 31.76 | 24.74 | 20.28 | 25.63 | 24.01 | 24.16 | 20.11 |
| **Total South of Umgeni River .. ..** | 21.79 | 20.76 | 18.21 | 18.02 | 22.04 | 24.65 | 27.00 | 22.83 | 17.05 | 21.48 | 25.07 | 24.07 | 19.59 |
| Ratio to 1926 (= 100).. .. .. .. | 118.17 | 112.58 | 98.75 | 97.72 | 119.52 | 133.68 | 146.42 | 123.81 | 92.46 | 116.49 | 135.95 | 130.53 | 106.24 |
| INANDA .. .. .. .. .. .. .. .. | 22.80 | 25.90 | 26.76 | 25.95 | 26.19 | 31.27 | 36.57 | 33.24 | 28.20 | 32.94 | 40.45 | 37.51 | 32.32 |
| LOWER TUGELA .. .. .. .. .. .. | 19.45 | 21.62 | 20.83 | 22.61 | 22.90 | 25.19 | 29.51 | 27.35 | 21.30 | 24.42 | 31.10 | 29.49 | 26.58 |
| **Total for North Coast between Umgeni and Tugela Rivers .. .. ..** | 20.59 | 23.07 | 22.83 | 23.67 | 23.96 | 27.19 | 31.89 | 29.35 | 23.64 | 27.31 | 34.09 | 32.14 | 28.57 |
| Ratio to 1926 (= 100).. .. .. .. | 110.64 | 123.97 | 122.68 | 127.19 | 128.75 | 146.10 | 171.36 | 157.71 | 127.03 | 146.75 | 183.18 | 172.70 | 153.52 |
| **Total for Natal South of the Tugela (excluding Zululand).. .. .. .. ..** | 21.03 | 22.21 | 21.19 | 21.65 | 23.27 | 26.27 | 30.07 | 26.87 | 21.18 | 25.18 | 30.64 | 29.08 | 25.35 |
| Ratio to 1926 (= 100).. .. .. .. | 113.37 | 119.73 | 114.23 | 116.71 | 125.44 | 141.62 | 162.10 | 144.85 | 114.18 | 135.74 | 165.18 | 156.77 | 136.66 |
| MTUNZINI .. .. .. .. .. .. .. | 18.40 | 19.56 | 18.75 | 18.85 | 20.97 | 24.67 | 27.86 | 27.06 | 22.67 | 24.96 | 30.71 | 27.19 | 23.73 |
| ESHOWE .. .. .. .. .. .. .. .. | 17.47 | 17.95 | 17.64 | 17.26 | 20.69 | 28.03 | 29.89 | 26.62 | 23.53 | 25.11 | 27.46 | 27.27 | 22.68 |
| LOWER UMFOLOZI .. .. .. .. .. | 19.84 | 17.93 | 18.28 | 23.04 | 28.81 | 34.40 | 33.25 | 31.00 | 26.10 | 26.51 | 33.45 | 31.47 | 30.07 |
| HLABISA .. .. .. .. .. .. .. .. | 17.31 | 14.79 | 12.72 | 18.60 | 25.36 | 30.91 | 28.81 | 29.60 | 26.31 | 29.84 | 30.79 | 29.00 | 25.52 |
| **Total North of the Tugela (Zululand).** | 18.91 | 18.28 | 18.00 | 20.52 | 24.68 | 29.62 | 30.51 | 28.91 | 24.55 | 26.09 | 31.28 | 29.08 | 26.30 |
| Ratio to 1926 (= 100).. .. .. .. | 79.35 | 76.71 | 75.54 | 86.11 | 103.57 | 124.30 | 128.03 | 121.32 | 103.02 | 109.48 | 131.26 | 122.03 | 110.37 |
| **GRAND TOTAL FOR NATAL (including Zululand) .. .. .. .. .. ..** | 20.24 | 20.84 | 20.10 | 21.27 | 23.75 | 27.37 | 30.22 | 27.55 | 22.36 | 25.49 | 30.87 | 29.08 | 25.70 |
| Ratio to 1926 (= 100).. .. .. .. | 99.02 | 101.96 | 98.34 | 104.06 | 116.19 | 133.90 | 147.85 | 134.78 | 109.38 | 124.71 | 151.03 | 142.27 | 125.73 |
| Rainfall of all Districts (inches) .. .. (*Average from 44 centres*). | 31.12 | 44.60 | 46.12 | 50.10 | 39.48 | 40.38 | 47.63 | 43.37 | 26.18 | 49.41 | 53.31 | 36.45 | 31.99 |

# AREA OF CANE HARVESTED AND YIELDS BY DISTRICTS (EUROPEAN PLANTERS ONLY) 1945—46.

## COMPILED FROM UNION DEPARTMENT OF CENSUS RETURNS.

| DISTRICTS. | UBA. | | Co.281. | | Co.290. | | Co.301. | | P.O.J.2725 and 2878. | | OTHER VARIETIES. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Acres. | Tons/ acre. | Acres. | Tons/ acre. | Acres. | Tons/ acre. | Acres. | Tons/ acre. | Acres. | Tons/ acre. | Acres. | Tons/ acre. |
| Port Shepstone ... ... ... | 12 | 18.58 | 2,832 | 19.07 | 42 | 16.55 | 112 | 23.30 | 4 | 10.75 | 3 | 16.33 |
| Umzinto ... ... ... ... | 1,686 | 14.49 | 19,132 | 20.04 | 2,533 | 15.56 | 3,494 | 21.62 | 134 | 21.30 | 114 | 24.33 |
| Durban and Pinetown ... ... | 72 | 12.24 | 4,574 | 20.42 | 322 | 17.51 | 1,804 | 20.08 | 3 | 33.00 | 1 | 13.00 |
| **Total South of Umgeni River ...** | 1,770 | 14.44 | 26,538 | 20.00 | 2,897 | 15.83 | 5,410 | 21.14 | 141 | 21.25 | 118 | 24.03 |
| Inanda ... ... ... ... | 1,352 | 17.59 | 14,673 | 32.51 | 853 | 27.47 | 5,554 | 36.02 | 120 | 28.13 | 264 | 36.78 |
| Lower Tugela ... ... ... | 522 | 12.62 | 25,674 | 26.36 | 1,897 | 21.23 | 14,698 | 27.98 | 100 | 41.92 | 184 | 32.92 |
| **Total for North Coast between Umgeni and Tugela Rivers...** | 1,874 | 16.21 | 40,347 | 28.60 | 2,750 | 23.17 | 20,252 | 30.18 | 220 | 34.40 | 448 | 35.20 |
| **Total for Natal South of the Tugela (excluding Zululand) ... ...** | 3,644 | 15.35 | 66,885 | 25.19 | 5,647 | 19.40 | 25,662 | 28.27 | 361 | 29.26 | 566 | 32.87 |
| Mtunzini ... ... ... ... | 177 | 23.86 | 16,724 | 23.50 | 435 | 29.89 | 2,034 | 22.65 | 122 | 41.03 | 111 | 35.21 |
| Eshowe ... ... ... ... | 15 | 7.93 | 7,744 | 22.65 | 923 | 17.30 | 1,041 | 23.05 | 631 | 29.07 | 56 | 40.46 |
| Lower Umfolozi ... ... ... | 334 | 19.92 | 19,008 | 30.70 | 567 | 19.94 | 2,415 | 26.07 | 2,291 | 33.18 | 58 | 24.66 |
| Hlabisa ... ... ... ... | 14 | 13.57 | 4,135 | 24.87 | 468 | 19.76 | 385 | 17.97 | 1,014 | 33.79 | 7 | 32.86 |
| **Total North of the Tugela (Zululand) ... ... ...** | 540 | 20.71 | 47,611 | 26.36 | 2,393 | 20.70 | 5,875 | 23.82 | 4,058 | 32.93 | 232 | 33.77 |
| **TOTAL FOR NATAL (including Zululand) ... ... ...** | 4,184 | 16.04 | 114,496 | 25.65 | 8,040 | 19.79 | 31,537 | 27.44 | 4,419 | 32.63 | 798 | 33.13 |

# AREA OF CANE HARVESTED AND YIELDS FOR DIFFERENT VARIETIES AND RATOONS.

## (EUROPEAN PLANTERS ONLY) 1945—46.

### COMPILED FROM UNION DEPARTMENT OF CENSUS RETURNS.

| VARIETY. | PLANT CANE | | FIRST RATOON | | SECOND RATOON | | THIRD RATOON | | FOURTH RATOON | | OTHER RATOONS | | TOTAL | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Acres. | Tons/ acre. | Acres. | Tons/ acre. | Acres. | Tons/ acre. | Acres. | Tons/ acre. | Acres. | Tons/ acre. | Acres. | Tons/ acre. | Acres. | Tons/ acre. |
| **Uba** ... ... ... ... ... | 106 | 26.34 | 118 | 25.86 | 274 | 19.84 | 864 | 17.97 | 1,025 | 14.25 | 1,797 | 14.30 | 4,184 | 16.04 |
| **Co.281** ... ... ... ... | 25,849 | 29.51 | 35,139 | 26.97 | 25,118 | 23.52 | 19,374 | 22.07 | 6,490 | 22.34 | 2,526 | 23.95 | 114,496 | 25.63 |
| **Co.290** ... ... ... ... | 454 | 19.75 | 827 | 20.26 | 1,623 | 19.73 | 2,737 | 19.89 | 1,438 | 17.67 | 961 | 22.48 | 8,040 | 19.79 |
| **Co.301** ... ... ... ... | 12,688 | 30.87 | 10,391 | 26.83 | 5,264 | 23.60 | 2,091 | 22.44 | 672 | 22.12 | 431 | 20.72 | 31,537 | 27.44 |
| **P.O.J.2725 and 2878** ... ... | 253 | 30.78 | 583 | 41.92 | 647 | 29.89 | 541 | 27.97 | 1,034 | 31.58 | 1,361 | 32.94 | 4,419 | 32.63 |
| **Other Varieties** ... ... ... | 647 | 34.70 | 59 | 31.37 | 21 | 28.19 | 6 | 18.33 | 44 | 16.89 | 21 | 32.86 | 798 | 33.13 |
| **Total** ... ... ... | 39,997 | 29.92 | 47,117 | 27.02 | 32,947 | 23.44 | 25,613 | 21.91 | 10,703 | 22.06 | 7,097 | 22.86 | 163,474 | 25.70 |

The PRESIDENT stated that the Annual Summaries constituted a historic record of the achievements of the industry which was of great use and was often referred to.

A distinguishing feature of the 1946-47 season was the large amount of trash adhering to cane. It might have been accentuated by the deficient rainfall, but he thought the practice of sending in more trash was on the increase. It was a most depressing sight to see rows of cane trucks in the mill yard with trashy cane. To illustrate the amount of trash that had to be dealt with at times he had taken four samples from a truck where little or no trashing had apparently been done. Three of the hand-samples were hand-trashed and topped, and the fourth sample was burnt and then topped. The results were as follows :—

| Sample. | Total weight in lbs. | Weight after trashing. | Weight after topping. | Per cent. trash. | Per cent. tops. | Per cent. trash and tops. | Average. |
|---|---|---|---|---|---|---|---|
| 1 ... | 162 | 131 | 120½ | 19.1 | 6.5 | 25.6 | |
| 2 ... | 168 | 128 | 123½ | 23.8 | 2.7 | 26.5 | 25.6 |
| 3 ... | 182 | 140 | 137 | 22.0 | 1.6 | 24.7 | |
| 4* | 194 | 166 | 147 | 14.4 | 9.8 | 24.2 | 24.2 |

*Burnt

The practice of consigning large quantities of extraneous matter with cane could not be sufficiently deprecated, since such matter adversely affected milling efficiency and reduced the overall recovery, and thus caused a reduction of the total output of sugar at a time when all possible sugar was needed for food.

There was need for a quick, if only approximate, method of checking variations in the efficiency of the Oliver-Campbell filtration and, if possible, to relate those variations to clarification.

He suggested that this might be accomplished by the use of iodine titrations of scums and returned filtrate from the Oliver-Campbell filters.

This method was tried experimentally during the 1946 season at Empangeni, with the following results: It was found that Oliver-Campbell filters eliminated in one average hour's filtration 55 per cent. of those substances which could be oxidised by iodine. Hourly elimination figures varied between 47 and 81 per cent. This method appears promising as a rapid method of estimating filtration efficiency, but it requires further investigation.

Mr. DUCHENNE stated that as a result of the dry season the sucrose per cent. cane, 13.63, was slightly better than expected at Umfolozi. The cane supply was fairly clean, but some drought-stricken cane and immature cane cut in July, from irrigated fields, adversely affected manufacturing results. A high crushing rate was maintained, and though pressed for tank space 82 tons of mixed juice were dealt with per hour. Since 1944 three locally-made clarifiers have been installed, so that a total tank capacity of 79,000 gallons was now available. Mixed juice purity was maintained at 85°, except for two weeks when crushing stale cane.

The average consumption of chemicals was : lime 36.5 lbs., sulphur 11.8 lbs., and phosphoric paste 2.1 lbs. per ton of sugar. The quick-lime, however, only contained 73-75 per cent. available calcium oxide. Because the available lime varied so much, it was better to report the grams calcium oxide per litre, or the pH of the primary hot liming. There were 0.7 to 1.0 gram calcium oxide per litre, corresponding to pH 8.7 to 9.0, which was found to be the point of quickest settling at 140°F. Sulphitation to a sulphur dioxide content of 1.5 grams per litre followed, but was found to be insufficient and was subsequently increased to 2 grams, averaging 1.63 grams per litre for the season. The suspension of phosphoric oxide of 10° Be was then added after liming to pH 7.7 or 7.8, before being discharged from the tempering tanks to secondary heaters.

The pH of the clarified juice and syrup were respectively 7.4 and 7.08. The average clarity of clarified juice was 26° Kopke for juice from continuous clarifiers, and 33° for juice from settling tanks. Evaporator scale increased in comparison with 1945. The activity of sulphide bacteria was also suspected, as decomposition of muds in the continuous clarifiers occurred with darkening of the juice, owing to difficulty in mud evacuation.

No difficulty was experienced in boiling, but the quantity of molasses and wash in circulation was always rather high. The ratio of second to third massecuites was higher than usual, and also the molasses per cent. cane 3.29 per cent. The purity of massecuites was generally 2° lower than the previous year and the brix 1° higher, the yield being 0.6 lb. per cubic foot lower on the average. There was an increase in the yield of sugar during cold spells. All first and second massecuites and three out of eight third massecuites were water-cooled for 2, 4 and 8 hours respectively. Water-cooling had definitely increased the crystallizer capacity. The high molasses production and drop in syrup purity could be ascribed mainly to difficulties in clarification and the quality of the cane from drought-stricken areas.

It was a difficult season, with peculiar juices which foamed profusely, particularly juices from P.O.J. canes, but the frothing in syrup, etc., was remedied by the addition of sulphonated vegetable oil, which cleared the scum in a few seconds.

Mr. DYMOND thought that we should again approach the Sugar Association for permission to substitute the names of mills for the numbers used at present, for these were only confusing and served no purpose. He also thought that more information could be given in these Annual Summaries. The refinery had some interesting information on the sugars from the various factories and he thought it might be published in the summaries.

We all agreed on the adverse effect of trash on milling and boiling-house work and its influence had

been shown by experiments in Louisiana, but in our cane payments trash was not taken into consideration at all, but is paid for as if it were cane of normal composition. He thought that this should be remedied in any new agreement.

He was interested in the control suggested by Mr. Buchanan on the Oliver filter. He had hoped that this strainer would be investigated, but in the past the trouble was the method of determining the amount of solids retained was so tedious. A quick test was required, and the method outlined by Mr. Buchanan seemed to be very promising for routine testing.

Mr. MOBERLY agreed with Mr. Dymond that the present system of cane payment was entirely unsatisfactory because growers were actually paid a bonus for sending in trash. Farmers did not quite realize the effect of trash on cane payments, and we should extract figures to bring the matter forcibly before them. Accurate cane-testing methods were largely a waste of time when large differences in trash in consignments had a much greater effect on the sucrose per cent. cane.

Dr. DODDS agreed that trash was a real menace to our industry at present. One effect was that it completely obscured the actual differences between varieties in sucrose content, because trash, apart from its effect on extraction and recovery, affected the sucrose per cent. cane to a surprising extent. Some interesting results had been obtained at the Experiment Station some years ago, when cane with and without trash was analysed.

The PRESIDENT informed Mr. Dymond that the Chemical Control Committee intended to undertake work on the measurement of adhering trash entering the factories. He would be willing to pass on to the Chemical Control Committee all the information and results in connection with iodine index test, so that the reliability of this test could be further explored.

Mr. DU TOIT pointed out that extraction ratios were now recorded in the Summary as percentages where they used to be given as fractions.

He agreed with all that was said about trash, or, as an American writer put it, the effects of trash were many and varied and all bad; but he thought we were fighting a losing battle in trying to get planters to send in clean cane. More attention should rather be paid to cleaning the cane at the mills. Labour shortages would naturally result in more trash being left on the cane, but the new varieties were more self-trashing than the old Uba, and he asked whether members thought that there was really more trash entering the factories now than in the days of 100 per cent. Uba.

Mr. DYMOND thought that the trash position was no worse now than in the days of Uba cane. The term trash was rather loosely used and sometimes included—wrongly, to his mind—all extraneous matter and cane tops. He agreed with Mr. du Toit that the way to deal with trash was to install cleaning devices at the mills, as had been done successfully in Hawaii. He thought it would be almost impossible to get planters to send in clean cane to the mills.

Mr. RAULT maintained that the amount of trash entering the factory was not so much a function of the variety, but was more a question of labour psychology. Years ago labour could be made to clean the cane in the fields, but that could not be done now, and the result was that the amount of trash and green tops entering the factories had increased in spite of the introduction of new varieties. In the course of the previous season an attempt was made at Natal Estates to get cleaner cane by lowering the basic task of cane cutters, which meant that the labourers were paid somewhat more for delivering the same weight of clean cane. The result was that mill extraction increased, and there was also a jump in boiling-house recovery, probably due to less impurities entering the factory as a result of the elimination of adhering trash, roots and dirt, and particularly green leaves.

Mr. GALBRAITH agreed with Mr. Rault that, as a result of labour difficulties, more trash and green tops were now coming into the factory, and consequently fibre percentages were rising and trouble was experienced in the factory as a result of the impurities from the tops, which made themselves felt in the third boiling, giving sticky massecuites which boiled slowly and gave poor yields.

Dr. DODDS, in reply to Mr. Dymond, stated the amount of data given in the Summaries had gradually increased, but there were still a great many omissions in comparison with similar publications in some other countries. He would like to see more data given in connection with some of the bio-chemical properties of the sugars and the general equipment of the factories. All technologists were agreed that it would be advisable to publish the names of the factories concerned, and he thought we should again approach the Millers' Association to get these changes made.

Mr. FELTHAM said that it was his opinion, as one who did a lot of travelling between the mills, that the cane had never been as dirty as it was this last season. The drought and shortage of labour might have been contributory causes for this undesirable feature, but under the present system of cane payment a planter could hardly be blamed for sending in unduly large proportions of trash. He did not think this was done so much from selfish motives, but more perhaps as a result of a change-over from burning to field-trashing as advocated by the Experiment Station, for soil and fertility conservation purposes. The cane was now burnt on the trucks, but this could not be very effective. The idea of cleaning the cane

at the mill site seemed good and its economic possibilities should be investigated. It was, however, only right that a commodity should be paid for according to its value, and a farmer should know that he would be penalized for sending in trash; but that, of course, was not done in our present system of cane payment.

Mr. MOBERLY drew attention to the common practice in the beet industry, where in the tare-laboratory all extraneous matter was subtracted from the total weight of beet delivered and farmers were paid on clean beet only. Something like that might have to be done to deal with the trash problem. It would not only provide a fair basis for cane payment, but would also provide a basis for paying bonuses to labourers, who would then soon enough realize that it was in their interests to cut and load only clean cane.

The effect of trash on cane payment had been forcibly illustrated to him in the recent Gledhow experiment, where an alternative method of sucrose distribution in consignments had been investigated by taking a sample by mechanical means from each consignment. These tests had been checked against hand samples. It was found that the sucrose percentage of these hand-samples was excessive, due apparently to the loss of trash during the process of hand-sampling.

Mr. DYMOND recalled that it was a common practice in Mauritius to trash the cane in the field before cutting it. He was at present conducting experiments on this pre-trashing method.

In reply to Dr. McMartin, Mr. Dymond stated that the pre-trashing was done in Mauritius about two or three months before cutting the cane; but as it might affect the sucrose per cent. cane, as suggested by Dr. McMartin, it could be done, say, only a day or two before cutting, and he did not think the work involved would be too much, as the process was actually quite quick.

Mr. ELYSEE gave their experience at Amatikulu for the past season. During the first months it was noticed that the sugar yields were extraordinarily high, and a thorough check-up of their methods of chemical control revealed that there was no error in the assessment of the sucrose entering the factory. For many years now recovery results had been steady, but last year there was a big improvement. The juice had improved compared with previous years, clarification was better and a rise of 1.5 per cent. purity was obtained from mixed juice to syrup, which was an advantage not achieved for many years. A reduced crushing rate resulted in the factory plant not being taxed to utmost capacity.

The only actual addition to the factory plant was the increase of the curing plant by 20 per cent.—an improvement which eliminated a bottle-neck and contributed appreciably to the better recovery. In the curing department better separation of molasses ensued and the return of molasses back to process was considerably reduced and a better yield of massecuites was obtained. The proportion of first boiling increased in ratio to the lower grades of massecuites. The cubic feet of massecuite per ton of sugar were reduced to 50.02 from 53.28 the previous season, and the yield of sugar rose to 40 lbs. per cubic foot from 37.54 lbs. yield the previous season.

There was no need to resort to water and steam for curing sugar, and it was, of course, known that the remelting of the finished product sugar in the centrifugals was detrimental to good recovery. There were, therefore, a number of contributory factors which have given a fillip to recovery at Amatikulu during the past season.

Mr. DYMOND stated that the normal undetermined loss at Darnall varied from 0.75 per cent. to 1.5 per cent. sucrose in mixed juice. For a consecutive period of ten weeks during September and October last year this loss rose to 3.08 and 3.18 per cent. respectively, representing a loss of 360 tons of sucrose. There were no abnormal conditions of inversion, entrainment or other sucrose losses.

Mr. DUCHENNE suggested to Mr. Dymond that the sucrose lost was probably in the molasses, but the use of the Jackson and Gillis method No. 4, on juices containing amino acids, might also lead to such discrepancies. It was for this reason that he used the baryta method, which he considered very accurate, and not the Jackson and Gillis No. 4 method.

Mr. HAYES said that there was a lot of confused talk about the effect of reversion products and amino acids on our methods of analyses. Reversion products, which were forms of condensation products, were hydrolysed in acid solution, and their optical activity changed. As a result of acid hydrolyses they became more laevorotary, and consequently a double polarization method using an acid inversion would give high sucrose results. The optical rotation of amino acids depended on pH and became more dextrorotary in acid solutions. Thus if the inverted acid solution in a double polarization method were not neutralized low sucrose results would be obtained. The invertase method gave, to the best of our knowledge, correct results.

The Jackson and Gillis No. 2 method, where hydrochloric acid was used for inversion, could give too high sucroses as a result of the hydrolysis of reversion products, but as the solution was neutralized before taking a reading the effect of amino acids was eliminated. Consequently the difference between the invertase method and the Jackson and Gillis No. 2 method gave a measure of reversion products present in terms of optical activity.

In the case of Jackson and Gillis No. 4 method the acid solution was not neutralized, and consequently the results could be affected by both reversion and amino acids. It could therefore be either higher or lower than the true sucrose, and the difference between the results from Jackson and Gillis No. 2 and No. 4 methods gave a measure of the amount of amino acids present in terms of optical activity. One of the disadvantages of the baryta method was that it did not eliminate amino acids.