ANNUAL WEATHER REPORT FOR 1951

By J. L. DU TOIT

It is customary to issue weather reports for each calendar year and this tradition is once more being followed for the sake of continuity of records. It is, however, fully realised that a yearly or two-yearly record of climatic conditions covering a period other than from January 1st to the end of December will be far more useful in dealing with our cane crop than the traditional one.

In Natal there is very little cane growth from June to August and planting generally starts with the beginning of the growing season and first rains in September. Harvesting of the predominantly two-year cane crop generally starts in May and rainfall later than this can do little to improve the prospects of the crop for that year. The rainfall from September to December is certainly most important for the crop to be cut during the next and the following year, but has a negligible effect on cane yields during the calendar year. In fact some mills might have closed and cutting stopped when part of this rain is recorded. Thus during the calendar year now under review the total rainfall was better than the previous year, but the cane crop suffered infinitely more from one of the worst droughts experienced. The rainfall during the last five months of 1951, however, accounted for more than 56 per cent. of the total rain for the year, whereas the same period during the previous year was very dry indeed and adversely affected the crop this year. It is therefore very necessary to have monthly rainfall returns from representative areas in the cane belt, and also to issue a report covering a period more suitable than the calendar year.

It is hoped in future to issue such a report at the end of May each year. At that time it should be possible to summarise the weather conditions that would have the main effect on the crop about to be harvested or the harvest of which had already started.

Monthly Summaries.

It was also for this reason that a monthly summary of weather conditions was started from the beginning of 1951. It may of course be preferable to have summaries covering even shorter periods, such as 10-day periods, but for the present monthly units will be a big advance on the past system with annual rainfall from 44 centres and a monthly distribution at the Experiment Station only.

In order to get these monthly rainfall returns on as representative a basis as possible, it was decided to allocate one recording station to approximately two per cent. of the total cane crop produced and to divide the area in magisterial districts as is done in the Government "Special Census of Sugarcane Plantations." It was, however, considered necessary to include rainfall returns from certain areas such as Hluhluwe, Mkuzi and Pongola, which at present certainly would not be justified on a production basis. The result is that there are in all 54 rainfall recording stations now reporting to us regularly.

Although the new recording centres are better distributed than the 44 used in the past, it would be a great pity to discontinue the data from these latter centres at present. We now have records for 23 years for these centres and it is proposed to continue publishing their annual rainfall returns until such time that a reasonably accurate average ratio between the rainfall at the new and old stations can be obtained, and the data from the old stations can be used for judging the annual rainfall at the new centres.

Monthly and Annual Rainfall Returns from 54 Centres.

The total rainfall for the calendar year 1951 from the 54 centres now supplying us with monthly rainfall data was as follows —

Magisterial District and Locality.		Total Rainfall from 1st January.
Port Shepstone	Mehlomnyama	34.29
Umzinto	Hibberdene	27.20
	Umtwalumi	26.99
	Sezela (Mill)	37.54
	Esperanza (Mill)	32.53
	Renishaw (Mill)	32.90
	Dumisa	29.53
Durban, Camperdown, Etc.		
	Illovo (Mill)	30.00
	Umbumbulu	28.07
	Thornville	33.25
Inanda	Mount Edgecombe—	
	(Milkwood Kraal)	34.27
	(Experiment Station)	34.37
	(Beach)	34.04
	La Mercy	35.44
	Canelands	31.59
	Tongaat (Frosterley)	32.82
	„ (Inyaninga)	32.27
	Inanda	40.17
	Tongaat (Mwawini)	37.56
Lower Tugela	Maidstone (Mill)	32.58
	Sinembe	35.61
	Upper Tongaat	40.43
	Frasers	33.72
	Chaka's Kraal (Exp. Farm)	30.90
	Chaka's Kraal	39.71
	Groutville	33.97
	Kearsney	36.55
	Doornkop (Mill)	32.20
	„ (Sprinz)	42.69
	Gledhow (Mill)	36.90
	Darnall (Mill)	34.49
	Tugela Mouth	36.81
Mtunzini	Mandini	31.49
	Amatikulu	31.04

Magisterial District and Locality.		Total Rainfall from 1st January.
Mtunzini—*continued.*		
	Inyoni	34.61
	Mtunzini	45.16
	Blackburn	33.28
Eshowe	Entumeni	31.40
	Eshowe	30.85
	Nkwalini	26.92
Lower Umfolozi ...	Felixton (Mill)	40.45
	Empangeni West	32.23
	Empangeni (Mill)	36.83
	Logoza	33.51
Lower Umfolozi—*continued.*		
	Ukulu Properties	31.25
	Mposa	31.70
	Kwambonambi	39.68
	Eteza...	32.00
Hlabisa	Mtubatuba (Mill)	22.83
	U.L.O.A.	36.75
	Nyalazi River	26.92
	Hluhluwe	17.64
Ubombo	Mkuzi	22.58
Piet Retief	Pongola	24.55

Rainfall in Inches by Districts for 1951 from 54 Centres.

The following table summarises the rainfall by districts during 1951 and shows the distribution of the rainfall during the year —

District.	No. of centres.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Total 1951.
Port Shepstone ...	1	6.42	2.63	4.43	0.97	0.63	0.11	0.00	2.40	1.97	5.99	1.04	7.70	34.29
Umzinto	6	4.28	2.43	5.89	0.55	0.58	0.14	0.05	3.07	2.91	4.35	0.86	6.02	31.12
Durban and Pinetown	3	5.86	2.33	4.93	0.73	0.37	0.21	0.02	4.07	2.34	3.44	1.19	4.74	30.44
Mean: South Coast...	10	4.97	2.42	5.46	0.65	0.52	0.16	0.04	3.22	2.65	4.24	0.98	5.80	31.23
Inanda	9	4.01	2.18	6.19	1.84	0.35	0.79	0.08	5.23	2.90	3.39	1.19	6.38	34.73
Lower Tugela	13	3.96	2.24	4.56	1.45	0.58	1.27	0.14	6.29	2.82	3.81	1.14	7.87	35.89
Mean North Coast ...	22	3.98	2.22	5.23	1.62	0.49	1.07	0.12	5.95	2.85	3.64	1.16	7.26	35.41
Mean South of Tugela	32	4.29	2.28	5.30	1.32	0.50	0.39	0.10	5.10	2.79	3.83	1.10	6.80	34.10
Mtunzini	5	3.13	2.10	3.25	1.10	1.57	2.26	0.56	6.32	2.66	4.24	0.66	6.88	35.12
Eshowe	3	3.10	1.14	4.05	1.62	0.51	0.41	0.03	6.35	2.53	4.19	0.74	5.01	29.72
Lower Umfolozi ...	8	4.35	2.01	4.08	2.34	1.27	1.71	1.23	5.33	2.83	3.79	0.45	5.25	34.71
Hlabisa	4	1.99	1.98	4.28	2.39	0.74	0.76	0.45	4.31	1.13	3.24	0.12	4.65	26.04
Ubombo	1	3.33	0.45	3.01	1.68	0.39	0.50	0.04	5.99	0.01	3.57	0.02	3.59	22.58
Piet Retief	1	2.30	0.13	3.71	4.33	0.49	0.52	2.19	3.69	0.00	3.49	0.00	3.70	24.55
Mean: Zululand (incl. Piet Retief)	22	3.33	1.83	3.90	2.03	1.05	1.38	0.74	5.46	2.28	3.82	0.46	5.33	31.53
General Mean	54	3.90	2.10	4.74	1.61	0.72	1.03	0.35	5.28	2.58	3.82	0.85	6.20	33.06

It may be found that in some cases the addition of the monthly rainfalls may not equal the totals given for the year. These very slight discrepancies are due to a single centre in a district perhaps not sending in a monthly return, whereas the totals for the year will include these omissions.

Annual Rainfall Returns from 44 Centres.

As usual the annual returns of rainfall for the 44 centres which have now reported for the past 23 years are given. From these figures it will be seen that only the three stations immediately north of Durban had a rainfall above the average and that the mean rainfall for 1951 was 5.11 inches below the 23 years' average or only 87.29 per cent. of normal. It is also clear that the deficiency in rainfall was less on the North Coast than on the South Coast and that Zululand suffered most from the drought.

The rainfall figures for the South Coast, North Coast and Zululand are as follows —

	Average rainfall for 1951 in inches.	Average rainfall for 1929-1951 in inches.	1951 rainfall per cent. of mean.
South Coast: mean of 9 stations south of Umgeni River	35.34	40.82	86.58
North Coast: mean of 21 stations between Umgeni and Tugela Rivers	35.42	39.02	90.77
Zululand: mean of 14 stations north of Tugela River ...	34.46	41.61	82.82
Total averages 44 stations .	35.10	40.21	87.29

Rainfall at the Experiment Station.

The following table gives the rainfall for 1951 by months at the Experiment Station compared with the average for the past 26 years —

	1951.					Mean 1926-1951 inclusive.					
	Total for month in inches.	Aggregate from 1st January.	Per cent. of average aggregate.	No. of rain days.	Average rainfall per rain day in ins.	Total for month in ins.	Aggregate from 1st January.	No. of rain days.	Average rainfall per day.	Per cent. of wet days.	Average rainfall per rain day.
January ...	3.41	3.41	89.3	12	0.284	3.82	3.82	14	0.123	44	0.273
February ...	1.82	5.23	62.1	9	0.202	4.60	8.42	12	0.163	42	0.383
March	8.11	13.34	99.0	11	0.737	5.05	13.47	12	0.163	39	0.421
April... ...	2.14	15.48	96.7	10	0.214	2.54	16.01	8	0.085	28	0.318
May	0.19	15.67	86.4	3	0.063	2.12	18.13	5	0.068	17	0.424
June	0.74	16.41	82.6	5	0.148	1.73	19.86	4	0.058	14	0.433
July	0.11	16.52	78.4	1	0.110	1.20	21.06	4	0.039	13	0.300
August ...	5.56	22.08	98.4	8	0.695	1.37	22.43	6	0.044	18	0.228
September .	2.59	24.67	101.2	9	0.289	1.94	24.37	8	0.064	28	0.243
October	2.84	27.51	99.64	16	0.178	3.24	27.61	14	0.104	46	0.231
November .	0.81	28.32	89.45	10	0.081	4.05	31.66	14	0.135	46	0.289
December...	6.05	34.37	95.37	18	0.336	4.38	36.04	15	0.141	48	0.292
Total ...	34.37	34.37	95.37	112	0.306	Mean	36.04	116	0.099	32	0.311

The following table shows that while the average rainfall on the North Coast is practically identical for the new and the old recording centres, there is an appreciable discrepancy for the other two centres. The averages for the new data are lower in the case of the South Coast because low rainfall centres in cane growing areas are substituted for high rainfall areas such as Durban Point and the Botanic Gardens and, in the case of the area north of the Tugela, low rainfall areas such as Hluhluwe and Pongola are now included.

1951 Rainfall Returns.

	From the stations used in the past.	From the stations now submitting monthly returns.	New stations per cent. of the old ones.
South Coast... ...	35.34	31.23	88.37
North Coast... ...	35.42	35.41	99.97
North of Tugela ...	34.46	31.53	91.50
Total for Industry	35.10	33.06	94.19

Rainfall at the Experiment Station.

Where a greater amount of data from other centres is now available and where the rainfall distribution in the various districts is known, the rainfall at any one centre becomes of less importance; but the Experiment Station records are more detailed than those from other centres and consequently the data are given as before.

The calendar year 1951 must certainly be classed as a year of deficient rainfall, the average rainfall for 44 recording stations being only 35.10 inches compared with the 23-year mean of 40.21 inches or 87.29 per cent. of normal, but 1950 was even drier, with only 30.70 inches of rain. During 1951, however, the cane suffered infinitely more from the drought than the previous year, and the crop was consequently very much poorer; 1950, however, followed a year with a rainfall above the average whereas the 1951 crop suffered from the accumulated effects of two years of deficient rainfall.

It was remarked last year that the period September to November, 1950, was exceptionally dry. Good rains certainly fell during December of that year and the first half of January, 1951, but the latter half of January was dry and the crop was evidently vulnerable to dry conditions, for at the end of the month quite a number of planters reported that the cane was showing signs of drought. February, which is normally one of our peak rainfall and best growing months, was exceptionally dry, with an average rainfall for 54 recording stations of only 2.10 inches of rain and the cane was making poor growth with the crop prospects decidedly poor. Better rains, particularly on the North and South Coasts, fell in March, but the total rainfall for the year, 10.75 inches, remained low.

The deficient summer rains were followed by most disappointing late rains in April and May and by the end of May the drought position was very serious over the whole industry, with patches of cane dying. It was then clear that the crop would be most disappointing. During the winter the

drought became progressively worse and in July 17 out of the 53 centres then reporting recorded no rain at all. Beautiful rains during the latter half of August at last broke one of the worst droughts ever experienced. One could hardly have wished for the drought to be broken in a more ideal manner. Not only was the rainfall for August excellent in quantity, 5.28 inches, and most general throughout the industry, but it fell as steady soaking rains which were nearly all absorbed with little or no run-off. This was an excellent start for the new planting season, but the rains came too late to affect the season's crop. After the excellent August rains and normal rains during September and October, the new crop suffered a minor setback in November when it was again exceptionally dry. Fortunately excellent rains fell during December and the crop prospects at that time were better than the previous year.

Temperatures.

The mean screen temperature for the year at the Experiment Station was 67.6°F. or 1.1° lower than the 1928—50 average of 68.7°F. In fact the Experiment Station records show that, with the exception of April, the mean temperatures for 1951 were lower than the 24 years' average for every month of the year. The temperatures during January, June, July and August were particularly low compared with the averages. Exceptionally heavy frosts did a lot of damage during the months of June and July in many areas. The following areas reported frosts in June and July: Hibberdene, Dumisa, Umtwalumi, Sezela, Umbumbulu, Thornville (frost here the worst for very many years), Natal Estates, La Mercy, Tongaat, Frasers, Chaka's Kraal, Kearsney, Inyoni, Blackburn, Entumeni, Nkwalini and Mkuzi.

The hottest month of the year, as usual, was February and this year by a large margin, when the mean temperature was 73.9°. The coldest month also as usual, was July with a mean temperature of 60.4°, but June was not much warmer and had a mean temperature of 60.8°.

The highest screen temperature recorded at the Experiment Station was 100.5° on 9th September and the lowest 42.5° on 29th July.

Screen Temperatures at the Experiment Station.

The following are the screen temperatures by months in degrees Fahrenheit at the Experiment Station for 1951 compared with those of the 1928–1951 averages —

	1951.					1928-1951 inclusive.			
	Maximum.	Minimum.	Mean.	Plus or minus average.	Daily range.	Maximum.	Minimum.	Mean.	Daily range.
January ...	78.4	64.5	71.4	−2.5	13.9	81.0	67.0	73.9	14.0
February .	81.2	66.5	73.9	−0.6	14.7	81.7	67.3	74.5	14.4
March ...	79.1	66.6	72.4	−0.7	12.5	80.3	65.8	73.1	14.5
April ...	78.1	62.6	70.3	+0.1	15.5	78.4	62.1	70.2	16.3
May... ...	74.3	56.9	65.6	−0.8	17.4	75.9	56.9	66.4	19.0
June	72.0	49.7	60.8	−1.9	22.3	72.9	52.6	62.7	20.3
July... ...	70.7	50.2	60.4	−1.5	20.5	72.3	51.6	61.9	20.7
August ...	70.7	52.0	61.4	−2.1	18.7	73.2	53.8	63.5	19.4
September.	72.6	56.6	64.6	−1.3	16.0	74.6	57.2	65.9	17.4
October ...	73.4	62.2	67.8	−0.6	11.2	76.0	60.8	68.4	15.2
November.	78.6	62.5	70.6	−0.1	16.1	78.1	63.2	70.7	14.9
December .	78.0	65.3	71.6	−1.3	12.7	80.2	65.6	72.9	14.6
Means...	75.6	59.6	67.6	−1.1	16.0	77.1	60.3	68.7	16.8

Atmospheric Conditions.

The mean true atmospheric pressure at the Experiment Station was 29.75 inches or practically identical to our average barometric pressure of 29.76. The highest monthly average barometric pressure was 29.93 inches in July and the lowest 29.64 inches in November. The maximum pressure for the year was 30.34 inches on July 18th and the lowest 28.99 inches on November 25th in the afternoon.

The average humidity at the Station for the year was 75.8 per cent. saturation at 8 a.m. and 66.6 per cent. at 2 p.m. compared with our averages of 73.4 and 62.9 per cent.

The total evaporation from a free water surface was 46.14 inches for the year, which is, surprisingly enough for such a dry year, slightly below our average.

The total hours of sunshine for the year were 2,306.3 or 53.8 per cent. of total hours of daylight.

Conclusions.

The first signs of the disastrous drought of 1951 were noticed during the latter half of January and when the rains failed during the important cane growing month of February. The rainfall during March was about normal, but with disappointing late rains the position was very serious at the end of May and became progressively worse until excellent rains during the latter half of August broke one of the worst droughts experienced in the industry. Unprecedented frosts during June and July made the position worse, although the new crop suffered a setback in November after good spring rains; excellent rains in December have improved the prospects for the new year.

The mean temperature during 1951 was exceptionally low; in fact it was the coolest year experienced at the Experiment Station since 1935.

ANNUAL RAINFALL 1933-1951.

Station.	Recorder.	1933.	1934.	1935.	1936.	1937.	1938.	1939.	1940.	1941.	1942.	1943.	1944.	1945.	1946.	1947.	1948.	1949.	1950.	1951.	Average
Port Shepstone ..	Lightkeeper, S.A.R. & H. . ..	40.58	38.55	42.01	49.63	38.25	42.52	44.08	27.66	23.12	54.16	51.65	31.24	33.43	37.14	48.19	38.24	32.69	47.34	35.15	**41.79**
Umzumbi	A. H. G. Blamey	36.35	37.50	43.66	51.24	40.63	42.82	42.86	27.74	23.78	51.98	44.86	26.93	31.51	36.61	47.78	39.60	27.33	44.80	33.84	**39.37**
Esperanza	Reynolds Bros., Ltd.	32.81	46.13	43.70	44.74	36.14	41.41	47.31	30.48	19.49	44.29	63.64	39.09	35.30	31.16	55.66	42.13	41.37	30.62	32.53	**40.53**
Renishaw.	Crookes Bros., Ltd.	34.43	42.17	42.69	46.10	44.40	36.13	46.90	31.83	25.16	43.33	46.74	35.26	24.35	29.63	49.09	38.41	36.42	28.72	32.90	**38.42**
Park Rynie	Ellingham Estate	37.71	46.53	47.89	52.85	46.10	43.22	56.25	34.46	27.40	47.14	51.25	40.16	31.78	35.30	49.54	42.51	42.54	31.28	35.26	**42.62**
Illovo	Illovo Sugar Estates, Ltd. . ..	26.94	41.00	39.03	51.65	30.79	43.09	42.22	30.10	26.17	56.12	43.40	30.49	28.85	30.67	53.42	42.14	36.04	22.96	30.00	**37.43**
Umbogintwini ..	African Explosives & Industries, Ltd.	36.43	45.59	52.87	53.09	34.78	41.94	48.53	31.26	28.18	51.89	49.16	37.75	31.74	34.91	56.69	43.95	35.51	26.43	33.90	**40.72**
Durban (Berea) ..	Natal Herbarium	31.61	42.28	58.08	46.71	36.09	41.23	47.26	38.35	30.06	51.12	52.97	31.30	28.91	32.49	49.68	42.62	41.68	24.85	38.59	**40.35**
Durban (Point) ..	S.A. Railways & Harbours ..	34.42	47.45	60.93	56.85	45.84	41.89	62.57	40.99	34.95	58.91	61.86	34.04	28.63	38.91	52.55	41.03	49.15	32.35	45.92	**46.14**
Effingham	Natal Estates, Ltd.	19.63	30.57	46.86	42.28	28.25	32.40	35.33	26.75	22.15	42.90	43.83	29.80	29.03	28.85	44.77	42.89	36.63	22.87	36.24	**32.76**
Westbrook	Natal Estates, Ltd.	31.18	38.49	55.06	52.14	33.56	41.68	45.75	40.05	29.09	52.43	60.15	37.04	33.78	31.18	40.87	44.29	43.40	27.72	42.40	**40.56**
Milkwood Kraal ..	Natal Estates, Ltd.	22.15	31.96	43.07	36.45	23.49	34.98	36.24	34.97	23.02	45.03	48.46	27.35	26.70	27.83	40.99	37.99	40.11	23.16	34.27	**32.91**
Mount Edgecombe	Natal Estates, Ltd. (Mill) ..	30.94	40.03	57.41	49.60	36.55	43.13	46.06	40.23	28.34	51.66	55.40	32.66	30.31	30.66	40.93	41.59	41.24	27.94	34.81	**39.81**
Mount Edgecombe	S.A.S.A. Experiment Station ..	27.14	39.42	53.25	45.36	33.21	37.97	42.87	37.31	24.35	45.41	51.32	30.32	28.50	29.55	36.74	38.66	36.61	26.33	34.37	**36.60**
Cornubia	Natal Estates, Ltd.	29.98	40.25	59.21	52.27	40.37	44.84	51.66	42.80	30.66	53.17	59.51	35.15	34.78	29.25	43.42	41.90	41.25	28.97	38.25	**41.21**
Burnside	Natal Estates, Ltd.	27.55	39.61	53.26	47.48	34.01	39.76	48.67	44.91	29.54	50.68	56.39	33.71	32.29	31.81	42.45	39.95	40.66	27.29	37.03	**39.15**
Blackburn	Natal Estates, Ltd.	24.94	33.94	48.78	43.67	34.70	35.45	49.84	36.99	22.68	43.48	51.96	29.73	28.49	27.98	35.50	35.00	39.56	24.89	35.46	**35.98**
Beach	Natal Estates, Ltd.	31.53	43.18	59.09	49.19	38.62	44.24	54.88	40.81	28.76	48.74	49.53	33.07	37.26	32.79	48.20	36.81	38.68	25.93	34.04	**41.43**
Saccharine	Natal Estates, Ltd.	29.22	42.38	51.95	55.98	32.07	36.91	42.05	38.41	23.73	46.57	51.70	34.14	32.04	28.83	40.84	36.05	40.02	26.65	32.27	**37.89**
Ottawa	Natal Estates, Ltd.	28.72	39.08	47.55	44.66	47.32	37.83	41.95	39.18	22.16	52.57	55.35	32.65	27.16	31.69	40.03	36.81	39.12	25.79	31.55	**36.95**
La Mercy	Gersigny Bros.	31.16	37.64	56.27	45.65	35.17	45.36	49.41	42.63	25.26	53.89	50.86	32.34	31.39	34.87	39.50	34.21	39.54	27.18	35.44	**40.15**
Tongaat..	Tongaat Sugar Co., Ltd.	26.59	38.44	47.54	50.87	35.61	40.85	44.67	40.87	22.72	55.67	53.08	31.37	30.75	33.90	39.84	31.14	34.65	25.45	32.58	**38.26**
Sinembe	H. C. Heenan	38.64	49.99	41.84	56.80	35.17	42.07	45.80	43.53	25.25	51.64	50.42	34.15	30.86	33.48	47.21	32.58	45.39	30.51	35.61	**40.90**
Umhlali..	G. P. Ladlau	35.13	41.20	53.61	56.57	40.29	56.88	58.14	39.72	29.49	54.74	52.60	37.16	34.25	37.12	43.93	34.67	38.94	30.22	36.65	**42.64**
Chaka's Kraal ..	Waldene Sugar Estate	30.14	35.09	43.38	46.74	32.87	38.40	42.27	30.81	21.78	47.42	44.33	31.01	32.15	30.67	39.01	31.31	39.72	28.85	30.74	**35.57**
Tinley Manor . ..	Sir J. L. Hulett & Sons, Ltd. ..	35.44	41.20	50.97	56.83	38.38	46.35	48.93	41.16	24.37	47.73	47.78	32.49	27.46	32.59	45.08	33.38	40.14	28.02	35.72	**39.87**
Riet Valley	H. E. Essery	37.98	47.70	44.33	65.99	35.28	41.96	51.39	45.90	27.37	54.75	61.35	39.17	36.31	33.68	45.75	31.98	51.50	36.16	36.74	**43.09**
Kearsney	Sir J. L. Hulett & Sons, Ltd. ..	37.45	53.57	38.42	64.34	39.73	44.30	47.46	50.80	31.91	49.74	58.02	37.05	32.67	39.18	47.95	34.22	52.74	30.32	37.23	**43.54**
Darnall	Mrs. Mann	25.45	49.91	44.04	56.32	40.68	45.56	44.65	48.48	25.49	48.19	54.84	43.26	34.88	32.28	46.62	31.17	49.18	31.66	37.90	**40.69**
Darnall	Sir J. L. Hulett & Sons, Ltd. ..	29.22	48.24	40.23	52.09	39.75	43.74	43.80	47.10	25.27	46.02	52.45	38.59	28.46	30.58	41.27	30.54	48.55	28.87	34.49	**39.51**
Mandini..	St. Andrews Estate	27.41	55.34	45.88	51.25	35.34	40.86	38.34	41.01	26.70	48.91	56.67	41.28	30.24	30.41	47.18	26.84	44.94	34.29	31.49	**39.66**
Amatikulu	Sir J. L. Hulett & Sons, Ltd. ..	29.86	47.66	43.41	47.86	35.38	37.24	47.53	50.40	27.80	48.87	55.37	39.08	28.45	26.34	38.61	25.21	44.39	26.67	31.04	**38.36**
Gingindhlovu . ..	P C. Lilburn	33.08	50.91	53.16	52.68	39.62	40.10	54.12	53.75	30.35	56.40	62.73	47.02	36.28	29.98	42.55	30.28	51.64	28.71	38.49	**43.50**
Mtunzini	G. V. W. Roberts	40.03	59.28	53.02	55.62	43.57	44.23	65.11	62.16	39.08	60.31	66.31	53.71	50.98	39.63	50.17	39.95	54.77	35.71	45.16	**49.79**
Eshowe..	District Forest Officer	47.31	71.85	46.18	66.61	47.56	46.40	52.55	70.67	36.57	47.44	68.80	50.17	45.40	41.57	52.04	37.37	58.34	39.85	38.48	**50.21**
Felixton	Sir J. L. Hulett & Sons, Ltd. ..	31.43	58.72	50.16	58.71	51.96	38.62	54.99	61.15	30.08	53.45	52.48	48.62	37.62	39.40	56.43	41.40	51.22	42.45	40.45	**48.28**
Empangeni West..	W. H. Simpson	22.92	41.08	36.40	36.62	39.10	32.93	47.01	41.24	24.50	40.74	48.47	38.05	28.64	25.00	37.62	25.20	43.51	29.93	32.23	**36.02**
Empangeni Rail ..	F. S. Mann	27.72	45.60	37.28	47.54	45.31	35.99	52.02	53.46	26.79	48.11	54.13	44.67	33.98	33.13	50.85	31.78	50.64	39.15	36.45	**41.49**
Empangeni	Zululand Sugar Millers & Planters.	29.55	48.72	38.18	49.48	47.87	33.49	51.79	53.11	24.54	45.06	50.05	39.56	30.78	33.21	50.88	31.85	51.36	38.91	36.83	**41.53**
Kulu Halt	C. F. M. Hibberd	30.15	48.26	35.03	48.39	56.80	36.95	52.91	57.61	23.97	52.28	55.73	43.02	32.45	31.75	50.74	30.35	51.84	37.19	33.51	**43.08**
Mposa	W. Springorum	25.43	46.45	29.59	46.81	51.80	33.08	47.63	51.62	20.58	43.56	44.64	34.04	29.49	28.05	42.86	27.79	44.06	37.60	31.70	**38.44**
Kwambonambi ..	S. Larsen	29.35	64.21	34.27	41.64	49.37	33.42	42.91	53.82	20.81	47.01	50.75	36.50	28.38	27.44	39.43	28.04	44.53	31.83	31.74	**40.30**
Eteza	Haworth Bros.	29.85	44.05	25.73	42.21	49.95	35.98	41.26	61.81	22.04	41.15	54.36	33.55	26.90	24.47	36.29	27.12	52.47	29.44	32.00	**38.24**
Riverview	Umfolozi Co-op. Sugar Planters, Ltd.	25.05	37.36	21.44	35.98	39.45	36.33	39.93	54.95	16.45	38.92	50.42	36.11	33.97	22.83	28.06	19.98	43.41	24.79	22.83	**33.70**
		31.15	44.74	45.83	50.13	39.57	40.33	47.68	43.48	26.18	49.40	53.31	36.45	31.99	32.02	44.83	35.25	43.35	30.70	35.10	**40.21**

Note.—The 1929 1931, and 1932 records have been omitted for lack of space.