

WEATHER REPORT FOR THE YEAR

1st JUNE, 1966 — 31st MAY, 1967

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General Scope of Report

This report records the weather experienced along the South African sugar-belt during the year ending 31st May, 1967, and compares it with data accumulated in the past. As in previous years, the report will deal primarily with the rainfall recorded by 54 measuring stations scattered throughout the cane-growing areas from Port Shepstone in the south to Pongola in the north. Other climatic data quoted, such as evaporation rates and soil and air temperatures, refer specifically to Mount Edgecombe where these readings were taken. These figures will, however, reflect broadly the conditions prevailing in the rest of the area.

Rainfall during the year under review will be discussed in some detail. In addition, the rainfall experienced during the year June 1965 to May, 1966 will be referred to, since the crop being harvested this season will have been influenced by the weather during both years.

Tabulated Data

Table I gives the annual rainfall recorded at each of the 54 measuring stations for the past 5 years.

Table II indicates the mean monthly rainfall during the past year for each of the magisterial districts covered by this survey, as well as for each of the 3 main sub-divisions.

In Table III can be seen the calculated mean rainfall for the past 43 years, as well as the monthly percentage distribution. Also given are the actual mean monthly rainfall figures for all recording stations, plus the corresponding evaporation figures for the Experiment Station. The evaporation figures are recorded from an open water surface in a square "Symons" tank.

Table IV gives the rainfall distribution for 2 years according to growing periods for the magisterial districts and for the main sub-divisions.

Table V gives the monthly rainfall for the 54 centres for the past 4 years, and also the rainfall deficiency, if any, per month.

Table VI is a list of the maximum, minimum, and mean screen temperatures as recorded at the Experiment Station during the past year, plus the comparative mean figures over the past 39 years.

Table VII lists the mean monthly earth temperatures at Mount Edgecombe over the past year, as well as the figures for the past 32 years for comparison.

Comments on Rainfall

The South African sugar-belt had a mean rainfall of 38.65 inches for the year ending 31st May,

1967. This is only fractionally higher than the 43-year average of 38.25 inches. More than 60% of the total fell during the first four months of 1967, with the result that the current cane crop is in excellent condition.

With the exception of August, every month from June to December, 1966 was drier than the past average. This factor, coupled with above average evaporation figures, resulted in retarded cane growth up to that stage. Good rains and ample heat produced rapid growth from January to April, 1967. Although May has been very dry, satisfactory growth has taken place during this, the last month of the period under review.

Monthly Details

The following is a more detailed month by month report for the past year. The good rains experienced during May, 1966, did not follow on into June, which was a dry month. Cane fields became even drier in July, when only 0.39 inches fell, compared with the 1.17 inches average during the past 43 years. Only 4% of the recording centres reported more than one inch of rain for the month, whilst 8% reported no rain at all. In the Midlands and at Melmoth frost put further stress on crops already affected by drought. Although August brought slightly above average rains, the sugar-belt was still dry. The lack of rain was carried on through September, October, November and December. Above average evaporation rates during this period increased the adverse effect of the low rainfall. Evapotranspiration losses dissipated what rain fell, and soil moisture reserves were not being replenished. Taken over the calendar year of 1966, rainfall for the area was 29.99 inches. This is unusually low, and compares with the 38.25 inches of the mean annual figure.

The rainfall picture, however, changed dramatically during 1967. Excellent rains, averaging 6.16 inches, fell during January. All centres with the exception of the Hluhluwe/Mtubatuba area reported ideal growing conditions. Further good rains fell in February. Hot and humid conditions kept the cane growing rapidly. The March rainfall of 7.06 inches left no grounds for complaint, with the exception of the Hluhluwe area where only 1.76 inches was recorded for the month. The adjacent Mtubatuba area had received less than 10 inches of rain during the first three months of 1967. Very satisfactory rains fell again in April, and optimum cane growth continued. It is not often that the sugar industry has enjoyed such a long period of uninterrupted hot humid weather virtually ideal for cane

growth. By the end of the month, cane yield estimates made at the end of 1966 could be revised sharply upward. The response of the crop to good growing conditions, and its subsequent recovery are quite remarkable.

The year under review ended on a very dry note. The month of May had a mean rainfall of only 0.47 inches. Some centres on the South Coast recorded no rain at all, whilst the mean figure for the whole South Coast was only 0.12 inches. Nevertheless, the cane in most areas is reported to be in good condition. This is, of course, due mainly to the really pleasing rains which fell during the previous four months.

Two-Year Summary

The following paragraph is a brief review of weather conditions experienced over the past two years. In June, 1965, frost damaged cane in many areas. The June rainfall was very satisfactory, but by the end of August cane fields were dry. Copious early spring rains fell during the last few days of August. Reasonable rains continued until November, but low soil and air temperatures restricted growth. December was relatively cool and dry. Excellent rains and warm weather got the cane growing really well for the first seven weeks of 1966. However, the lowest rainfall ever recorded in the cane belt for the month of March heralded a sharp and most unwelcome autumn drought. It was not until May that adequate rains supplied enough moisture to green up the crop again. From June to December, 1966 cane growth was hampered by lack of rain. Odd showers which fell during this period were soon dissipated. The first four months of 1967 saw a complete reversal of the situation when ample rains fell. Accelerated growth during this period enhanced prospects of much higher yields. Although there was very little rain in May, satisfactory cane growth was nevertheless maintained during the month.

Temperatures

The mean screen temperature for the year under review was 68.2°F at the Experiment Station. This was half a degree cooler than the past 39 year mean. With the exception of June and December, all months from June, 1966 to May, 1967, were below the past average in regard to air temperature. Soil temperatures were also below average, particularly at the depth of four feet, where it was consistently cooler than the average for the past 32 years. The minimum temperature at grass level did not once fall below freezing point. On two nights during July, 1966, however, the temperature fell to just over one degree above freezing level.

Evaporation

Evaporation from a free water surface was 52.82 inches for the year. This was 4.97 inches more than the average for the past 32 years. Rainfall deficiency, as expressed in Table V, was reasonable

during the past year. The earlier part of the optimum growth period had a somewhat high rainfall deficiency, but the first four months of 1967 had virtually no deficiency at all, and excellent growth resulted.

TABLE I
Rainfall for 54 Centres

	Rainfall for year 1st June 1962 to 31st May 1963	Rainfall for year 1st June 1963 to 31st May 1964	Rainfall for year 1st June 1964 to 31st May 1965	Rainfall for year 1st June 1965 to 31st May 1966	Rainfall for year 1st June 1966 to 31st May 1967
Port Shepstone:					
Mahlomnyama	46.13	43.89	33.32	36.03	35.41
Umzinto:					
Hibberdene	42.95	37.43	51.11	42.19	35.57
Mtwalume	36.52	37.17	45.91	39.32	29.29
Sezela Mill	39.66	42.62	52.44	48.75	35.60
Esperanza Mill	46.48	42.10	41.02	45.67	33.68
Renishaw Mill	42.50	40.88	40.87	45.20	33.36
Dumisa	39.85	35.97	42.20	48.95	35.91
Durban, Camperdown, etc.					
Illovo Mill	46.80	40.15	43.06	42.86	34.80
Umbumbulu	36.93	32.21	29.51	44.40	36.67
Thornville	27.23	35.41	24.53	33.75	37.98
Inanda:					
Mount Edgecombe—					
Effingham	34.17	37.92	26.78	35.02	31.66
Experiment Stn.	36.46	35.00	23.50	35.20	30.88
Burnside	38.52	33.49	26.12	36.08	31.81
La Mercy	37.51	34.85	29.08	35.20	35.75
Canelands	47.89	42.26	24.73	48.14	34.33
Tongaat—					
Frosterly	44.17	36.99	26.28	32.29	35.93
Inyaninga	41.06	36.62	22.50	32.88	34.71
Inanda	42.90	43.47	32.34	41.06	44.25
Tongaat—					
Mwawine	36.10	37.50	30.47	38.30	38.61
Lower Tugela:					
Maidstone Mill	38.04	33.38	25.74	31.74	34.42
Sinembe	40.18	32.21	26.90	37.77	40.26
Upper Tongaat	42.33	38.85	31.02	37.92	42.02
Frasers Estate	39.11	33.78	27.70	37.62	42.43
Chaka's Kraal					
Experimental Farm	40.68	34.88	26.82	38.76	43.74
Chaka's Kraal	43.14	35.15	26.69	41.14	43.72
Groutville	34.10	31.55	23.46	35.22	40.17
Kearney	41.42	39.63	28.77	44.85	48.13
Doornkop Mill	33.71	33.25	22.71	33.21	45.47
Doornkop Sprinz	43.83	38.78	25.54	46.08	52.29
Gledhow Mill	38.41	35.14	24.99	37.50	37.38
Darnall Mill	46.49	40.97	26.33	43.30	43.16
Tugela Mouth	43.22	41.37	37.16	50.21	45.96
Mtunzini:					
Mandini	40.24	42.98	24.87	45.32	44.22
Amatikulu Mill	35.61	43.67	24.50	37.29	38.50
Inyoni	37.39	41.54	24.52	43.70	43.38
Mtunzini	43.26	54.33	37.16	48.75	63.73
Blackburn	37.72	46.30	27.34	38.66	44.78
Eshowe:					
Entumeni Mill	43.51	38.39	25.07	37.21	43.86
Eshowe	51.32	54.56	29.10	45.72	46.56
Nkwatani	30.26	35.04	15.69	26.48	32.68
Lower Umfolozi:					
Felixton Mill	44.52	57.21	41.19	57.41	57.60
Empangeni West	32.48	52.45	24.66	31.92	37.94
Empangeni Mill	38.60	53.33	30.90	42.45	44.26
Kulu Halt	38.21	54.67	26.55	38.97	41.61
Ukulu Properties	31.32	47.87	27.55	33.19	37.20
Mposa	33.05	53.71	25.94	37.95	32.97
Kwambonambi	36.88	56.60	31.24	47.68	38.17
Eteza	33.76	47.70	27.69	43.88	33.61
Hlabisa:					
Mtubatuba Mill	30.86	40.89	22.06	29.47	27.43
U.L.O.A.	39.37	54.76	31.09	43.50	31.81
Nyalazi River	30.62	41.18	21.04	36.36	34.97
Huhluwe	24.47	43.85	14.49	28.03	25.23
Uboombo:					
Mkuzi	22.27	32.05	17.48	19.54	32.39
Piet Retief:					
Pongola	24.92	21.59	16.95	25.21	28.71
Mean	38.32	40.92	29.02	39.17	38.65

TABLE II

Rainfall in Inches by Districts for Months of June, 1966, to May, 1967, inclusive

District	No. of Centres	1966						1967					Total June 1966 to May 1967	
		June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.		May
Port Shepstone	1	3.02	0.00	1.25	1.70	1.32	3.43	2.99	6.88	3.80	4.17	6.85	0.00	35.41
Umzinto	6	2.06	0.24	1.25	1.50	1.45	3.89	2.91	5.74	4.13	5.93	4.76	0.05	33.91
Durban Pinetown etc.	3	1.36	0.22	1.24	1.62	1.62	4.53	3.05	5.62	5.61	7.66	3.66	0.29	36.48
Mean: S. Coast	10	1.94	0.21	1.25	1.56	1.49	4.03	2.96	5.82	4.54	6.27	4.64	0.12	34.83
Inanda	9	0.88	0.34	1.58	1.45	2.29	4.62	3.84	6.26	3.25	6.75	3.83	0.23	35.32
Lower Tugela	13	0.96	0.52	1.62	2.22	2.46	4.14	4.59	8.28	5.46	8.60	3.83	0.33	43.01
Mean: N. Coast	22	0.93	0.45	1.60	1.90	2.39	4.33	4.29	7.45	4.56	7.84	3.83	0.29	39.86
Mean: S. of Tugela	32	1.25	0.37	1.49	1.80	2.11	4.24	3.87	6.94	4.55	7.35	4.08	0.24	38.29
Mtunzini	5	1.86	0.65	2.39	2.53	2.63	3.15	3.97	6.93	4.55	9.87	7.81	0.58	46.92
Eshowe	3	1.03	0.18	1.19	2.07	2.22	4.33	4.16	7.84	5.37	7.58	4.78	0.27	41.03
Lower Umfolozi	8	1.13	0.52	2.80	2.14	2.05	2.29	2.51	4.07	4.84	6.79	10.31	0.97	40.42
Hlabisa	4	0.60	0.25	1.42	1.41	1.52	1.98	2.72	2.58	7.51	2.58	6.30	0.99	29.86
Ubombo	1	0.10	0.00	0.56	0.44	0.50	2.22	4.04	4.93	10.24	4.86	2.35	2.15	32.39
Piet Retief	1	0.62	0.00	0.40	0.41	1.37	2.36	6.56	4.66	4.19	4.42	3.22	0.50	28.71
Mean: Zululand and Piet Retief	22	1.11	0.40	2.02	1.93	2.01	2.71	3.36	5.03	5.55	6.64	7.58	0.82	39.16
General Mean	54	1.19	0.39	1.71	1.85	2.07	3.62	3.66	6.16	4.96	7.06	5.51	0.47	38.65

TABLE III

Rainfall and Evaporation Data

	Mean Percentage Rainfall Distribution 1924-1967	Computed Mean Rainfall for 54 Centres 1924-1967	Actual Rainfall for 54 Centres June 1966 to May 1967	Evaporation at Experiment Station	
				Mean 1936-67	June 1966 to May 1967
June	4.16	1.59	1.19	2.38	2.17
July	3.06	1.17	0.39	2.54	2.77
August	3.71	1.42	1.71	3.00	3.38
September	6.51	2.49	1.85	3.69	4.29
October	9.41	3.60	2.07	4.24	4.87
November	11.24	4.30	3.62	4.80	5.66
December	12.10	4.63	3.66	5.52	6.88
January	11.82	4.52	6.16	5.73	6.39
February	12.00	4.59	4.96	4.80	4.80
March	13.26	5.07	7.06	4.67	5.22
April	7.66	2.93	5.51	3.52	3.58
May	5.07	1.94	0.47	2.86	2.81
	100.00	38.25	38.65	47.85	52.82

TABLE IV

Rainfall in Inches by Districts for the Two-Year Period June, 1965, to May, 1967, inclusive

District	No. of Centres	1965 Winter Growth June to August	1965 Early Growth Sept. and October	1965-1966 Optimum Growth Nov. to March	1966 Late Growth April and May	1966 Winter Growth June to August	1966 Early Growth Sept and October	1966-1967 Optimum Growth Nov. to March	1967 Late Growth April and May	Total for two years June 1965 to May 1967
Port Shepstone	1	7.50	5.54	15.76	7.23	4.27	3.02	21.27	6.85	71.44
Umzinto	6	10.59	8.84	18.83	6.75	3.55	2.95	22.60	4.81	78.92
Durban, Pinetown, etc.	3	9.59	6.34	19.29	5.13	2.82	3.24	26.47	3.95	76.83
Mean: South Coast	10	9.98	7.76	18.66	6.31	3.40	3.05	23.62	4.76	77.54
Inanda	9	9.65	6.21	15.69	5.59	2.80	3.74	24.72	4.06	72.46
Lower Tugela	13	9.53	6.17	18.59	5.35	3.10	4.68	31.07	4.16	82.65
Mean: North Coast	22	9.59	6.18	17.39	5.45	2.98	4.29	28.47	4.12	78.47
Mean: South of Tugela	32	9.71	6.68	17.78	5.72	3.11	3.91	26.95	4.32	78.18
Mtunzini	5	9.39	9.40	18.26	5.70	4.90	5.16	28.47	8.39	89.66
Eshowe	3	6.73	6.55	18.96	4.23	2.40	4.29	29.28	5.05	77.50
Lower Umfolozi	8	8.69	11.12	18.27	3.60	4.45	4.19	20.50	11.28	82.10
Hlabisa	4	7.63	6.55	17.92	2.24	2.27	2.93	17.37	7.29	64.20
Ubombo	1	3.18	2.66	11.74	1.96	0.66	0.90	26.29	4.50	51.93
Piet Retief	1	2.01	3.18	17.29	2.73	1.02	1.78	22.19	3.72	53.92
Mean: Zululand and Piet Retief	22	7.83	8.53	17.96	3.80	3.53	3.94	23.29	8.40	77.28
Mean: General	54	8.95	7.42	17.86	4.94	3.29	3.92	25.46	5.98	77.82
Computed Mean for 43 years	54	4.18	6.09	23.11	4.87	4.18	6.09	23.11	4.87	76.50

TABLE V

Rainfall and Evaporation in Inches for the Past Four Years

	1963/64			1964/65			1965/66			1966/67		
	Evapora-tion	Rainfall	Rainfall Deficiency	Evapora-tion	Rainfall	Rainfall Deficiency	Evapora-tion	Rainfall	Rainfall Deficiency	Evapora-tion	Rainfall	Rainfall Deficiency
June	2.41	4.47	0.00	2.66	1.81	0.85	2.70	4.29	0.00	2.17	1.19	0.98
July	2.36	6.62	0.00	2.56	1.30	1.26	2.18	1.38	0.80	2.77	0.39	2.38
August	3.47	0.44	3.03	3.50	0.69	2.81	3.05	3.28	0.00	3.38	1.71	1.67
September	3.68	0.87	2.81	3.58	1.73	1.85	3.59	2.78	0.81	4.29	1.85	2.44
October	4.59	3.57	1.02	3.61	6.71	0.00	4.84	4.64	0.20	4.87	2.07	2.80
November	5.93	3.50	2.43	5.54	3.09	2.45	4.40	4.04	0.36	5.66	3.62	2.04
December	6.41	3.98	2.43	6.55	3.76	2.79	6.31	3.25	3.06	6.88	3.66	3.22
January	6.53	8.52	0.00	6.10	2.65	3.48	6.11	6.65	0.00	6.39	6.16	0.23
February	5.96	2.67	3.29	5.81	2.64	3.17	5.02	3.24	1.78	4.80	4.96	0.00
March	5.28	2.11	3.17	6.34	1.22	5.12	6.18	0.68	5.50	5.22	7.06	0.00
April	4.91	3.71	1.20	4.22	1.32	2.90	3.95	2.13	1.82	3.58	5.51	0.00
May	2.63	0.46	2.17	3.00	2.10	0.90	3.15	2.81	0.34	2.81	0.47	2.34
Total	54.16	40.92	21.55	53.47	29.02	27.55	51.48	39.17	14.67	52.82	38.65	18.10

TABLE VI

The following are the Screen Temperatures by Months in Degrees Fahrenheit at the Experiment Station for the Year June, 1966, to May, 1967, compared with the Means for the Period 1928 to 1967

	THIS PERIOD					AVERAGE 1928 to 1967 INCLUSIVE			
	Maximum	Minimum	Mean	Plus or minus average	Daily range	Maximum	Minimum	Mean	Daily range
June	73.4	54.0	63.7	+0.9	19.4	72.8	52.7	62.8	20.1
July	72.1	50.4	61.2	-0.9	21.7	72.3	51.9	62.1	20.4
August	71.8	54.1	62.9	-0.7	17.7	73.2	54.0	63.6	19.2
September	72.9	56.3	64.6	-1.3	16.6	74.3	57.5	65.9	16.8
October	74.5	59.5	67.0	-1.3	15.0	75.6	60.9	68.3	14.7
November	76.3	63.3	69.8	-0.7	13.0	77.5	63.5	70.5	14.0
December	80.1	66.7	73.4	+0.6	13.4	79.8	65.8	72.8	14.0
January	80.1	67.5	73.8	-0.4	12.6	80.9	67.4	74.2	13.5
February	79.9	68.0	74.0	-0.6	11.9	81.4	67.7	74.6	13.7
March	78.6	65.1	71.8	-1.5	13.5	80.4	66.2	73.3	14.2
April	76.5	63.0	69.6	-0.2	13.5	78.0	62.2	70.1	15.8
May	74.3	57.6	66.0	-0.3	16.7	75.6	57.0	66.3	18.6
Mean	75.9	60.5	68.2	-0.5	15.4	76.8	60.6	68.7	16.2

TABLE VII

The following Table gives the Mean Monthly Earth Temperatures

Month	Experiment Station 1935-1967			Experiment Station June 1966 to May 1967		
	1 foot	2 feet	4 feet	1 foot	2 feet	4 feet
June	63.8	66.3	69.3	63.5	65.3	68.2
July	62.5	64.3	66.8	61.5	63.3	66.2
August	64.5	65.5	66.6	63.9	64.0	65.1
September	67.8	68.1	68.0	66.9	66.6	66.2
October	70.7	70.7	70.0	69.3	68.5	67.8
November	73.5	73.3	72.4	73.0	72.0	69.8
December	76.5	76.1	74.3	77.2	75.4	72.3
January	78.7	78.7	76.4	78.3	77.0	74.1
February	79.5	79.3	77.7	78.4	77.4	75.2
March	78.2	78.7	77.9	77.4	77.2	75.6
April	74.7	76.0	76.4	73.6	74.8	74.5
May	69.1	71.2	73.2	69.3	70.7	72.5
Mean	71.6	72.3	72.4	71.0	71.0	70.6

Hours of Sunshine

During the year, Mount Edgecombe had had 2409.6 hours of sunshine, representing one per cent more than the 40-year average. November, January, February and April were cloudier than in the past, while all other months were more sunny than the average of previous figures.

Wind

The anemometer in the meteorology site at the Experiment Station recorded 39,330 miles of air as having passed the site during the year. This represents an average wind speed of 4.5 m.p.h. over the entire period. Based on figures for only three years, the wind pattern ranges from 3.2 m.p.h. for

the month of July up to 5.9 m.p.h. for November and December.

Conclusions

Fluctuating weather conditions have prevailed in the sugar-growing areas of South Africa during the past two years. The winter of 1965 brought frost damage to some cane crops. Spring and early summer were moist but cool. The first seven weeks of 1966 provided ideal cane growing weather. This deteriorated into a short severe autumn drought which was relieved only in May. From June to December, crop growth was limited by a shortage of moisture. The first four months of 1967 had ample rain and heat for most satisfactory cane growth. Although May was very dry, the crop continued growing well, and it can be said that present prospects are very bright.