

WEATHER REPORT FOR THE YEAR 1st JUNE 1963, TO 31st MAY, 1964

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General Scope of Report

As in previous years this report will deal primarily with the rainfall recorded by 54 measuring stations situated between Pongola in the north and Port Shepstone in the south, thus straddling the present South African cane-growing areas. Other climatic data such as evaporation rates, and soil and air temperatures refer specifically to Mount Edgecombe where these readings were taken. Since this is roughly the centre of the canebelt, however, these figures must reflect broadly the conditions in the rest of the area.

Rainfall during the period of June, 1963 to May, 1964 will be discussed in some detail. In addition, the rainfall experienced during the previous year will be referred to, since the crop being harvested this season will have been influenced by the weather during both years.

Table I gives the annual rainfall recorded at each of the 54 measuring stations for the past five 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 three main sub-divisions.

In table III can be seen the calculated mean rainfall for the past 40 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.

Table IV gives the rainfall distribution for two years according to growing periods for the magisterial districts and for the main subdivisions.

Table V gives the monthly rainfall for the 54 centres for the past four 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 36 years.

Table VII lists the mean monthly earth temperatures at Mount Edgecombe over the past year, as well as the figures for the past 29 years for comparison.

Distribution of rainfall during the year ending 31st May, 1964 was poor as far as the South African sugar industry was concerned. An abnormally wet winter was followed by a dry spring. The desiccated cane crop was saved by moderate rains during the early summer period. In January excellent rains fell, only to be followed by two very dry months at a time when the crop should have been making optimum growth. Good precipitation in April relieved matters only until lack of rain during May left most unirrigated areas with very dry soils. The adverse effect of this fluctuation

TABLE 1
Rainfall for 54 Centres

	Rainfall for year 1st June 1959 to 31st May 1960	Rainfall for year 1st June 1960 to 31st May 1961	Rainfall for year 1st June 1961 to 31st May 1962	Rainfall for year 1st June 1962 to 31st May 1963	Rainfall for year 1st June 1963 to 31st May 1964
Port Shepstone					
Mehlomnyama	39.17	48.21	36.25	46.13	43.89
Umzinto					
Hibberdene	35.87	54.56	34.40	42.95	37.43
Mtwalume	30.26	41.32	25.76	36.52	37.17
Sezela Mill	36.16	45.84	32.06	39.66	42.62
Esperanza Mill	35.38	46.60	35.97	46.48	42.10
Renishaw Mill	35.26	48.06	37.79	42.50	40.88
Dumisa	30.43	46.82	31.42	39.85	35.97
Durban, Camperdown, etc.					
Illovo Mill	30.84	43.18	39.64	46.80	40.15
Umbumbulu	28.39	42.46	29.40	36.93	32.21
Thornville	26.30	43.06	26.64	27.23	35.41
Inanda					
Mount Edgecombe—					
Effingham	26.08	35.64	27.75	34.17	37.92
Experiment Station	27.81	38.91	30.83	36.46	35.00
Burnside	30.01	42.23	33.88	38.52	33.49
La Mercy	28.42	46.52	28.12	37.51	34.85
Canelands	26.29	50.51	31.74	47.89	42.26
Tongaat—					
Frosterly	31.91	46.09	31.02	44.17	36.99
Inyaninga	32.95	43.86	31.97	41.06	36.62
Mwawine	37.59	48.10	31.33	36.10	37.50
Inanda	38.53	48.62	32.42	42.90	43.47
Lower Tugela					
Maidstone Mill	34.36	45.10	28.41	38.04	33.38
Sinembe	30.08	44.37	33.19	40.18	32.21
Upper Tongaat	37.55	49.46	35.63	42.33	38.85
Frasers Estate	36.55	45.38	30.83	39.11	33.78
Chaka's Kraal					
Experimental Farm	34.42	42.79	32.51	40.68	34.88
Chaka's Kraal	33.30	42.01	29.98	43.14	35.15
Groutville	32.61	38.60	26.33	34.10	31.55
Kearsney	40.83	41.81	37.04	41.42	39.63
Doornkop Mill	32.74	38.89	28.79	33.71	33.25
Doornkop Sprinz	41.95	52.48	40.05	43.83	38.78
Gledhow Mill	34.61	42.44	34.36	38.41	35.14
Darnall Mill	39.05	47.75	36.50	46.49	40.97
Tugela Mouth	45.40	54.04	43.49	43.22	41.37
Mtunzini					
Mandeni	37.63	41.94	35.49	40.24	42.98
Amatikulu Mill	40.03	48.29	32.98	35.61	43.67
Inyoni	39.02	50.90	31.54	37.39	41.54
Mtunzini	54.70	66.73	49.76	43.26	54.33
Blackburn	40.40	54.49	36.73	37.72	46.30
Eshowe					
Entumeni Mill	37.59	46.57	36.99	43.51	38.39
Eshowe	40.56	50.12	39.19	51.32	54.56
Nkwaleni	29.66	37.30	20.54	30.26	35.04
Lower Umfolozi					
Felixton Mill	57.81	68.67	49.98	44.52	57.21
Empangeni West	36.25	48.31	31.70	32.48	52.45
Empangeni Mill	40.15	61.50	36.72	38.60	53.33
Logoza	42.67	60.93	39.56	38.21	54.67
Ukulu Properties	36.65	57.45	29.68	31.32	47.87
Mposa	37.13	54.91	39.19	33.05	53.71
Kwambonambi	36.67	54.49	47.11	36.88	56.60
Eteza	37.08	43.12	44.84	33.76	47.70
Hlabisa					
Mtubatuba Mill	32.67	36.24	39.50	30.86	40.89
U.L.O.A.	49.91	47.76	55.90	39.37	54.76
Nyalazi River	36.53	31.66	33.83	30.62	41.18
Hluluwe	31.28	32.27	23.18	24.47	43.85
Ubombo					
Mkuzi	24.47	39.01	23.36	22.27	32.05
Piet Retief					
Pongola	25.89	28.67	18.24	24.92	21.59
Mean	35.66	46.43	34.10	38.32	40.92

of wet and dry periods must be borne in mind when comparing the average rainfall of 40.92 inches with the expected mean annual rainfall of 38.44 inches for our sugar areas.

The year under review started off well with unseasonal but very welcome showers during June, amounting to 4.49 inches over the cane-belt. This unexpected rainfall was of great benefit to the cane-crop which was extremely dry at that stage.

July, 1963 will long be remembered by many people in the sugar industry as an unusually wet month. The average rainfall recorded by our measuring stations was 6.62 inches compared with the computed mean over past years of only 1.04 inches for the month. Floods in the Lower Umfolozi area caused considerable damage, estimated at several million rand, to farms, crops and communications.

The two abnormally wet months of June and July were followed by two very dry months, with the result that conditions were again droughty by the time reasonable rains fell in October. Fair rainfall during November and December coupled with high temperatures permitted normal cane-growth during this period.

January, 1964 started the year off with excellent rains, plus hot sunny weather, resulting in rapid cane-growth. The rainfall of 8.52 inches was almost double the mean rainfall of 4.37 inches expected for January and was on the whole well distributed. February, on the other hand, brought one of those reversals in weather conditions which tend to characterize the South African cane-belt. Only 2.67 inches of rain fell during a month which normally has a rainfall averaging 4.71 inches. Furthermore, for a large part of the area concerned this precipitation occurred mainly at the beginning of the month. Thus, when March followed on with less than 40 per cent. of our normal rainfall, as well as the contributory effect of high temperatures, the cane crop was adversely affected. When satisfactory rains fell during April, the dry conditions which prevailed during February and March were relieved, and a definite improvement in cane growth was evident. However, a dry May soon had soil moisture levels down to a stage where good soaking rain was again being hoped for in all areas.

In reviewing the rainfall position over the past two years, it can be said that good rains in August, 1962 saw the end of a severe drought period consisting of eight months of deficient rainfall. Reasonably adequate rains from October until April, 1963, provided the cane crop with good growing conditions right throughout our optimum growth period. Then fol-

lowed 14 months of alternating wet and dry cycles. Such conditions do not foster a steadily maintained crop growth. It was wet in June and July, 1963, when the cane was unable to take advantage of moist conditions through lack of heat. Conversely it was dry in February and March, 1964, when the high temperatures prevailing at that time would have given excellent growth if moisture had been available. The period under review ends with the cane crop still in reasonably good fettle, but needing more rain to carry it through the drier winter months.

Temperatures

The mean screen temperature for the year under review was 69.3° F. at the Experiment Station, Mount Edgecombe. This was 0.6° F. higher than our 36 years' mean. June and July, 1963, were colder than usual, but from August until January, 1964, temperatures were above normal, with September being 3.3° F. above average. February was just below normal, but March was 2.0° F. higher than usual. April and May were colder than usual.

Evaporation

This year was yet another with high evaporation from a free water surface together with a high rainfall deficit (54.16 and 21.55 inches, respectively). The rainfall deficiency was particularly pronounced during our peak growing period from November to March, inclusive. During this time the industry can expect an evaporation of 25.24 inches together with a rainfall of 23.41 inches. Actual figures recorded were 30.11 inches and 20.78 inches, respectively. The only months during the year under review when rainfall exceeded evaporation were June, July and January.

Hours of Sunshine

The total hours of sunshine recorded for the year were 99.4 per cent. of the mean. The monthly hours of sunshine were inversely proportional to the monthly rainfall, with June, July and October being months with less sunshine than usual, whilst August, November, February and May were particularly sunny.

Conclusions

The South African sugar industry experienced an excellent growing season during the 1962/63 summer. Lack of rain and excessive evaporation rates during the period of optimum cane growth for 1963/64 combined to produce a very high rainfall deficiency during this important time. Temporary relief from this adverse effect was afforded by showers in April. By the end of May, however, conditions were dry again.

S.A.S.A. Experiment Station,
MOUNT EDGECOMBE.
7th July, 1964.

TABLE 2
Rainfall in Inches by Districts for Months of June, 1963, to May, 1964 inclusive

District	No. of Centres	1963										1964		Total June 1963 to May 1964
		June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	
Port Shepstone	1	1.43	4.99	0.50	1.87	4.46	3.30	10.12	9.48	3.60	1.48	1.71	0.95	43.89
Umzinto	6	1.77	5.33	0.16	1.51	3.71	4.16	8.25	6.14	2.58	2.31	2.90	0.55	39.37
Durban, Pinetown, etc.	3	0.76	5.31	0.08	0.89	4.50	2.88	5.49	6.53	1.97	3.31	3.88	0.32	35.92
Mean: S. Coast	10	1.43	5.29	0.17	1.36	4.02	3.69	7.61	6.59	2.50	2.53	3.07	0.52	38.78
Inanda	9	2.70	4.10	0.60	1.32	2.81	2.72	3.87	10.56	3.42	2.14	2.83	0.48	37.55
Lower Tugela	13	4.33	3.83	0.55	1.03	3.25	3.45	2.83	9.07	2.18	1.82	3.44	0.27	36.05
Mean: N. Coast	22	3.67	3.94	0.57	1.15	3.07	3.15	3.26	9.68	2.69	1.95	3.19	0.36	36.68
Mean: S. of Tugela	32	2.97	4.36	0.45	1.22	3.37	3.32	4.62	8.72	2.63	2.13	3.16	0.41	37.36
Mtunzini	5	7.01	5.96	0.67	0.51	5.93	4.09	1.91	9.40	3.84	2.20	4.88	0.37	46.77
Eshowe	3	5.17	6.22	0.41	0.40	2.72	4.79	3.07	11.23	3.27	0.75	3.89	0.75	42.67
Lower Umfolozi	8	8.68	14.18	0.52	0.32	4.24	3.79	3.08	7.54	2.41	3.10	4.43	0.68	52.97
Hlabise	4	5.88	11.08	0.07	0.04	3.40	2.50	5.54	6.72	1.64	2.20	5.67	0.43	45.17
Ubombo	1	1.36	6.38	0.57	0.57	2.47	4.33	1.34	7.95	2.63	0.87	3.20	0.38	32.05
Piet Retief	1	1.81	2.10	0.02	0.14	2.12	3.57	0.40	6.44	2.77	0.21	2.00	0.01	21.59
Mean: Zululand, Piet Retief	22	6.66	9.76	0.43	0.33	3.86	3.77	3.06	8.28	2.74	2.18	4.52	0.53	46.12
General Mean	54	4.47	6.58	0.44	0.87	3.57	3.50	3.98	8.52	2.67	2.15	3.71	0.46	40.92

TABLE 3
Rainfall and Evaporation Data

Month	Mean Percentage Rainfall Distribution 1924-1963	Computed Mean Rainfall for 54 Centres 1924-1963	Actual Rainfall for 54 Centres June, 1963, to May, 1964	Evaporation at Experiment Station Mean 1936-1963	June, 1962, to May, 1964
June	3.98	1.53	4.47	2.37	2.41
July	3.07	1.18	6.62	2.54	2.36
August	3.62	1.39	0.44	2.96	3.47
September	6.56	2.52	0.87	3.67	3.68
October	9.18	3.53	3.57	4.21	4.59
November	11.32	4.35	3.50	4.76	5.93
December	12.26	4.71	3.98	5.40	6.41
January	11.63	4.47	8.52	5.68	6.53
February	12.13	4.66	2.67	4.86	5.96
March	13.58	5.22	2.11	4.59	5.28
April	7.60	2.92	3.71	3.47	4.91
May	5.07	1.95	0.46	2.85	2.63
	100.00	38.44	40.92	47.31	54.16

TABLE 4

Rainfall in Inches by Districts for the Two-year Period June, 1962 to May, 1964 inclusive

	No. of Centres	1962 Winter Growth June to August	1962 Early Growth Sept. and October	1962-1963 Optimum Growth Nov. to March	1963 Late Growth April and May	1963 Winter Growth June to August	1963 Early Growth Sept. and October	1963-1964 Optimum Growth Nov. to March	1964 Late Growth April and May	Total for Two Years June, 1962 to May, 1964
Port Shepstone	1	3.42	8.00	34.20	0.51	6.92	6.33	27.98	2.66	90.02
Umzinto	6	2.87	5.56	31.49	1.42	7.26	5.22	23.44	3.45	80.72
Durban, Pinetown, etc.	3	2.52	3.98	28.82	1.65	6.15	5.39	20.18	4.20	72.89
Mean: South Coast	10	2.82	5.33	30.97	1.39	6.89	5.38	22.92	3.59	79.29
Inanda	9	4.28	3.46	29.89	2.22	7.40	4.13	22.71	3.31	77.40
Lower Tugela	13	3.47	4.85	29.33	2.69	8.71	4.28	19.35	3.71	76.39
Mean: North Coast	22	3.82	4.29	29.55	2.50	8.18	4.22	20.73	3.55	76.84
Mean: South of Tugela	32	3.51	4.61	29.99	2.15	7.78	4.59	21.42	3.57	77.62
Mtunzini	5	3.20	5.87	26.45	3.33	13.18	5.55	20.63	5.49	83.70
Eshowe	3	2.76	5.34	30.18	3.43	12.43	4.07	24.77	5.14	88.12
Lower Umfolozi	8	3.27	4.97	23.76	4.11	21.90	4.20	20.40	4.87	87.48
Hlabisa	4	3.63	3.82	21.34	2.53	17.03	3.44	18.60	6.10	76.49
Ubombo	1	1.91	2.47	16.75	1.14	8.31	3.04	17.12	3.58	54.32
Piet Retief	1	0.94	2.89	18.99	2.10	3.93	2.26	13.39	2.01	46.51
Mean: Zululand and Piet Retief	22	3.08	4.81	24.27	3.32	16.30	4.21	20.25	5.09	81.33
Mean: General	54	3.33	4.69	27.66	2.64	11.25	4.43	20.95	4.19	79.14
Computed Mean for 40 years		4.09	6.05	23.41	4.87	4.09	6.05	23.41	4.87	76.84

TABLE 5

Rainfall and Evaporation in Inches for the Past Four Years

Month	1960 - 1971			1961 - 1962			1962 - 1963			1963 - 1964		
	Evaporation	Rainfall	Rainfall Deficiency	Evaporation	Rainfall	Rainfall Deficiency	Evaporation	Rainfall	Rainfall Deficiency	Evaporation	Rainfall	Rainfall Deficiency
June	2.38	0.43	1.95	2.15	3.76	0.00	2.95	0.04	2.91	2.41	4.47	0.00
July	2.65	0.63	2.02	2.51	1.08	1.43	3.11	0.32	2.79	2.36	6.62	0.00
August	2.27	1.06	1.21	3.60	0.80	2.80	3.43	2.97	0.47	3.47	0.44	3.03
September	3.51	2.30	1.21	4.14	3.18	0.96	4.33	0.80	3.53	3.68	0.87	2.81
October	4.07	3.14	0.93	4.97	3.00	1.37	4.57	3.89	0.69	4.59	3.57	1.02
November	5.08	7.24	0.00	5.13	4.14	0.99	4.82	6.83	0.00	5.93	3.50	2.43
December	4.85	9.59	0.00	6.07	2.72	3.35	6.39	3.30	3.13	6.41	3.98	2.43
January	5.68	4.76	0.92	5.80	4.08	1.72	6.28	7.01	0.00	6.53	8.52	0.00
February	5.48	3.70	1.78	5.07	2.70	2.37	6.37	3.07	3.30	5.96	2.67	3.29
March	4.88	4.36	0.52	5.28	5.20	0.08	4.88	7.45	0.00	5.28	2.11	3.17
April	3.70	8.24	0.00	4.30	1.99	2.31	4.09	2.44	1.65	4.91	3.71	1.20
May	2.94	0.98	1.96	3.34	0.85	2.49	3.80	0.20	3.60	2.63	0.46	2.17
Total	47.49	46.43	12.50	52.36	34.10	19.87	55.02	38.32	22.07	54.16	40.92	21.55

TABLE 6

The following are the Screen Temperatures by Months in Degrees Fahrenheit at the Experiment Station for the Year June, 1963 to May, 1964, compared with the Means for the Period 1928 to 1963

Month	THIS PERIOD					AVERAGE 1928 TO 1963 INCLUSIVE			
	Maximum	Minimum	Mean	Plus or Minus Average	Daily Range	Maximum	Minimum	Mean	Daily Range
June	71.2	53.2	62.2	- 0.6	18.0	72.9	52.7	62.8	20.2
July	69.8	52.3	61.2	- 1.0	17.5	72.4	52.0	62.2	20.4
August	74.5	53.1	63.7	+ 0.2	21.4	73.3	53.7	63.5	19.6
September	77.4	61.0	69.1	+ 3.3	16.4	74.3	57.4	65.8	16.9
October	75.9	64.6	70.2	+ 1.8	11.3	75.8	61.0	68.4	14.8
November	78.4	66.2	72.3	+ 1.7	12.2	77.7	63.5	70.6	14.2
December	81.1	67.6	74.3	+ 1.5	13.5	79.8	65.8	72.8	14.0
January	80.8	69.3	75.0	+ 0.9	11.5	81.0	67.3	74.1	13.7
February	80.6	68.2	74.3	- 0.3	12.4	81.5	67.8	74.6	13.7
March	81.5	69.1	75.3	+ 2.0	12.4	80.4	66.2	73.3	14.2
April	76.5	61.2	68.7	- 1.5	15.3	78.2	62.2	70.2	16.0
May	74.3	56.3	65.4	- 1.0	18.0	75.8	57.0	66.4	18.8
Means	76.8	61.8	69.3	+ 0.6	15.0	76.9	60.5	68.7	16.4

TABLE 7

The following table gives the mean monthly earth temperatures

Month	Experiment Station 1935-63			Experiment Station June 1963 to May 1964		
	1 foot	2 feet	4 feet	1 foot	2 feet	4 feet
June	64.1	66.6	69.4	63.5	65.5	68.7
July	62.7	64.6	66.9	61.0	62.4	65.5
August	64.6	65.7	66.7	64.9	65.5	65.8
September	67.8	68.2	68.2	71.7	70.3	68.7
October	70.9	71.0	70.3	74.8	74.3	72.0
November	73.6	73.5	72.7	77.7	77.5	74.3
December	76.5	76.2	74.6	79.3	78.8	76.1
January	78.6	78.8	76.7	80.1	79.7	77.5
February	79.5	79.4	77.9	81.0	79.7	76.8
March	78.2	78.8	78.1	81.5	80.8	78.1
April	74.7	76.0	76.6	74.8	76.1	76.8
May	69.2	71.4	73.4	68.4	70.0	72.5
Mean	71.7	72.5	72.6	73.2	73.4	72.7