

WEATHER REPORT FOR THE YEAR 1st JUNE 1965 TO 31st MAY, 1966

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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, 1966, 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, 1964 to May, 1965 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 42 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 38 years.

Table VII lists the mean monthly earth temperatures at Mount Edgecombe over the past year, as well as the figures for the past 31 years for comparison.

TABLE I
Rainfall for 54 Centres

	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	Rainfall for year 1st June 1964 to 31st May 1965	Rainfall for year 1st June 1965 to 31st May 1966
Port Shepstone					
Mehlomnyama	36.25	46.13	43.89	33.32	36.03
Umzinto					
Hibberdene	34.40	42.95	37.43	51.11	42.19
Mtwalume	25.76	36.52	37.17	45.91	39.32
Sezela Mill	32.06	39.66	42.62	52.44	48.75
Esperanza Mill	35.97	46.48	42.10	41.02	45.67
Renishaw Mill	47.79	42.50	40.88	40.87	45.20
Dumisa	31.42	39.85	35.97	42.20	48.95
Durban, Camperdown, etc.					
Illovo Mill	39.64	46.80	40.15	43.06	42.86
Umbumbulu	29.40	36.93	32.21	29.51	44.40
Thornville	26.64	27.23	35.41	24.53	33.75
Inanda					
Mount Edgecombe:					
Effingham	27.75	34.17	37.92	26.78	35.02
Experiment Station	30.83	36.46	35.00	23.50	35.20
Burnside	33.88	38.52	33.49	26.12	36.08
La Mercy	28.12	37.51	34.85	29.08	35.20
Canelands	31.74	47.89	42.26	24.73	48.14
Tongaat—					
Frosterly	31.02	44.17	36.99	26.28	32.29
Inyaninga	31.97	41.06	36.62	22.50	32.88
Inanda	32.42	42.90	43.47	32.34	41.06
Tongaat—					
Mwawine	31.33	36.10	37.50	30.47	38.30
Lower Tugela					
Maidstone Mill	28.41	38.04	33.38	25.74	31.74
Sinembe	33.19	40.18	32.21	26.90	37.77
Upper Tongaat	35.63	42.33	38.85	31.02	37.92
Frasers Estate	30.83	39.11	33.78	27.70	37.62
Chaka's Kraal					
Experimental Farm	32.51	40.68	34.88	26.82	38.76
Chaka's Kraal	29.98	43.14	35.15	26.69	41.14
Groutville	26.33	34.10	31.55	23.46	35.22
Kearsney	37.04	41.42	39.63	28.77	44.85
Doornkop Mill	28.79	33.71	33.25	22.71	33.21
Doornkop Sprinz	40.05	43.83	38.78	25.54	46.08
Giedhow Mill	34.36	38.41	35.14	24.99	37.50
Darnall Mill	36.50	46.49	40.97	26.33	43.30
Tugela Mouth	43.49	43.22	41.37	37.16	50.21
Mtunzini					
Mandeni	35.49	40.24	42.98	24.87	45.32
Amatikulu Mill	32.98	35.61	43.67	24.50	37.29
Inyoni	31.54	37.39	41.54	24.52	43.70
Mtunzini	49.76	43.26	54.33	37.16	48.75
Blackburn	36.73	37.72	46.30	27.34	38.66
Eshowe					
Entumeni Mill	36.99	43.51	38.39	25.07	37.21
Eshowe	39.19	51.32	54.56	29.10	45.72
Nkwaleni	20.54	30.26	35.04	15.69	26.48
Lower Umfolozi					
Felixton Mill	49.98	44.52	57.21	41.19	57.41
Empangeni West	31.70	32.48	52.45	24.66	31.92
Empangeni Mill	36.72	38.60	53.33	30.90	42.45
Kulu Halt	39.56	38.21	54.67	26.55	38.97
Ukulu Properties	29.68	31.32	47.87	27.55	33.19
Mposa	39.19	33.05	53.71	25.94	37.95
Kwambonambi	47.11	36.88	56.60	31.24	47.68
Eteza	44.84	33.76	47.70	27.69	43.88
Hlabisa					
Mtubatuba Mill	39.50	30.86	40.89	22.06	29.47
U.L.O.A.	55.90	39.37	54.76	31.09	43.50
Nyalazi River	33.83	30.62	41.18	21.04	36.36
Hiuhluwe	23.18	24.47	43.85	14.49	28.03
Ubombo					
Mkuzi	23.36	22.27	32.05	17.48	19.54
Piet Retief					
Pongola	18.24	24.92	21.59	16.95	25.21
Mean	34.10	38.32	40.92	29.02	39.17

Comments on Rainfall

During the past year the South African sugar industry has suffered a repetition, on a smaller scale, of the disastrous summer drought of 1964/65. It is true that the drought of 1965/66 was less severe, and less prolonged than the previous one. Nevertheless an appreciable reduction in cane-growth has occurred this season as the result of moisture shortage during February, March and April.

Total rainfall for the year under review was 39.17 inches, or slightly higher than the computed mean annual figure of 38.23 for the past 42 years. Above average rains fell during the period June to October inclusive. November and December were drier than usual, but good rains fell in January, 1966. February followed with below average rainfall, and March (normally our wettest month) had only 0.68 inches, or 13% of the 42-year average for this month. Cane fields were still dry in April, but welcome showers during May relieved the position considerably.

Monthly details

The following is a more detailed month by month report for the past year. The rainfall for June, 1965 was a very satisfactory 4.29 inches, or nearly three times the average. Cane greened up well, but little growth occurred due to a cold spell. Frost damage was reported from many areas. During July the sugar belt had slightly above average rainfall. Nevertheless crops were reported to be dry in many parts.

Early spring rains fell at the end of August when most centres reported about 3 inches of rain during the last 4 or 5 days of the month. September followed with reasonable showers, and good growth was anticipated with the onset of warmer weather. Although further good rains fell in October, air and soil temperatures were still low. This lack of heat continued into November and retarded growth despite fairly good rainfall that month. December's cool, dry conditions also did not permit maximum cane growth.

The month of January saw the South African cane crop off to a fine start for 1966. Good steady showers during the month averaged 6.65 inches for the 54 recording centres throughout the area. Satisfactory soil moisture conditions, combined with sharply higher soil and air temperatures, got the cane growing really well for the first time this season. This rapid growth continued until mid-February, when lack of moisture and cooler weather slowed things down. The worst affected fields were those in the shallower sandy parts of the North Coast.

It was not only the Ides which boded ill for the sugar industry in March. During the entire month only 0.68 inches of rain fell. This is the lowest March rainfall figure recorded for the sugar belt, and contrasts with the 22.52 inches of rain which fell during March, 1925. Cloudless sunny days lifted the evaporation figure by 30% for the month. At the end of March conditions were serious, with brown patches of dead cane apparent in places. Odd showers during April did little to alleviate the drought. Soil moisture was

at a low ebb, and good soaking rains were needed to bolster the crop against the traditionally dry winter period.

The May rainfall was very beneficial to the North and South Coasts, but was well below expectations for Zululand. Thus by the 31st May, 1966, most of the cane crop was green and in fine fettle. Some areas around Empangeni and Mtubatuba, however, were still badly affected by drought.

Two-year Summary

The following paragraph is a brief review of weather conditions experienced over the past two years. In June and July, 1964, frost occurred at many points in the sugar belt. Dry conditions prevailed until October, when excellent soaking rains fell. The worst summer drought ever recorded in the industry took place from November right through until the end of May, 1965, when widespread rains brought relief to most centres. In June frost was again reported from many areas. Rainfall in early winter was satisfactory but soils dried out progressively until the end of August when good rains fell. The next three months were moist but cool. December tended to be dry and cool. January, 1966, provided optimum growing conditions which followed through into mid-February. From this stage onwards, however, the soils became increasingly drier and the industry suffered a short but severe drought. Good rains fell over most of the sugar belt during May. Thus by May 31st 1966, South African cane fields were (with the exception of those in Northern Zululand) quite moist, and the crops carried were green and healthy.

Temperatures

The mean screen temperature for the year under review was 67.6° F. at the Experiment Station. This was 1.1° F. cooler than the 38 years' mean. With the exception of September, January and March, all months from June, 1965 to May 1966 were below normal in regard to air temperature. The average soil temperatures were also consistently lower than in previous years. The grass minimum temperature, however, did not once fall below freezing point.

Evaporation

This year the evaporation from a free water surface was above normal by 3.82 inches. Nevertheless, the rainfall distribution was such that a fairly normal rainfall deficiency resulted (see table V). Unfortunately, the bulk of this deficiency occurred during the vital growing months of December, February, March and April. The deficit for March is almost certainly the highest recorded for one month in the South African cane belt.

Hours of Sunshine

During the year, Mount Edgecombe has had 2406.4 hours of sunshine, representing 1.4% more than the 39-year average. July, October and December were sunnier than usual, with March being well above

TABLE II
Rainfall in Inches by Districts for Months of June, 1965, to May, 1966 inclusive

District	No. of Centres	1965											Total June 1965 to May 1966	
		June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.		May
Port Shepstone	1	4.50	1.12	1.88	2.46	3.08	4.29	2.81	4.88	3.42	0.36	2.83	4.40	36.03
Umzinto	6	5.59	1.76	3.24	3.57	5.27	5.42	3.53	6.05	2.81	1.02	2.52	4.23	45.01
Durban, Pinetown, etc.	3	5.64	1.26	2.69	2.64	3.70	5.31	3.45	6.95	2.98	0.60	1.84	3.29	40.34
Mean: S. Coast	10	5.49	1.55	2.94	3.18	4.58	5.27	3.44	6.20	2.92	0.83	2.35	3.96	42.71
Inanda	9	4.78	1.64	3.23	2.67	3.54	3.77	3.94	4.79	2.56	0.63	1.69	3.90	37.13
Lower Tugela	13	4.94	1.48	3.11	2.54	3.63	4.47	4.28	6.25	2.93	0.66	2.18	3.17	39.64
Mean: N. Coast	22	4.88	1.55	3.16	2.59	3.59	4.18	4.14	5.65	2.78	0.64	1.98	3.47	38.61
Mean: S. of Tugela	32	5.07	1.55	3.09	2.78	3.90	4.52	3.92	5.82	2.82	0.70	2.09	3.63	39.89
Mtunzini	5	4.16	1.92	3.30	3.22	6.18	3.93	3.17	6.67	3.71	0.78	2.66	3.04	42.74
Eshowe	3	3.04	1.32	2.37	1.96	4.59	4.30	3.77	7.16	3.20	0.53	2.72	1.51	36.47
Lower Umfolozi	8	3.71	0.99	3.99	3.66	7.46	3.16	1.69	9.27	3.46	0.69	2.29	1.31	41.68
Hlabisa	4	2.12	0.68	4.83	2.34	4.21	2.99	1.29	7.98	5.07	0.59	1.63	0.61	34.34
Ubombo	1	0.47	0.44	2.27	0.15	2.51	0.97	0.90	5.60	4.06	0.21	1.29	0.67	19.65
Piet Retief	1	0.80	0.24	0.97	0.84	2.34	2.65	3.09	6.20	4.55	0.80	0.51	2.22	25.21
Mean: Zululand and Piet Retief	22	3.15	1.13	3.55	2.80	5.73	3.30	2.27	7.85	3.85	0.65	2.19	1.61	38.12
General Mean	54	4.29	1.38	3.28	2.78	4.64	4.04	3.25	6.65	3.24	0.68	2.13	2.81	39.17

TABLE III
Rainfall and Evaporation Data

Month	Mean Percentage Rainfall Distribution 1924-1966	Computed Mean Rainfall for 54 Centres 1924-1966	Actual Rainfall for 54 Centres June, 1965 to May, 1966	Evaporation at Experiment Station	
				Mean 1936-1966	June, 1965 to May, 1966
June	4.18	1.60	4.29	2.39	2.70
July	3.11	1.19	1.38	2.53	2.18
August	3.71	1.42	3.28	2.98	3.05
September	6.54	2.50	2.78	3.67	3.59
October	9.52	3.64	4.64	4.21	4.84
November	11.27	4.31	4.04	4.77	4.40
December	12.19	4.66	3.25	5.47	6.31
January	11.71	4.48	6.65	5.71	6.11
February	11.98	4.58	3.24	4.90	5.02
March	13.13	5.02	0.68	4.66	6.18
April	7.48	2.86	2.13	3.51	3.95
May	5.18	1.98	2.81	2.86	3.15
	100.00	38.23	39.17	47.66	51.48

TABLE IV

Rainfall in Inches by Districts for the Two-year Period June, 1964 to May, 1966 inclusive

District	No. of Centres	1964 Winter Growth June to August	1964 Early Growth Sept. and October	1964-1965 Optimum Growth Nov. to March	1965 Late Growth April and May	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	Total for Two Years June, 1964 to May, 1966
Port Shepstone	1	11.70	9.66	9.86	2.03	7.50	5.54	15.76	7.23	69.35
Umzinto	6	9.74	13.12	17.90	4.83	10.59	8.84	18.83	6.75	90.60
Durban, Pinetown, etc.	3	2.40	9.91	16.97	3.11	9.59	6.34	19.29	5.13	72.73
Mean: South Coast	10	7.74	11.81	16.82	4.03	9.98	7.76	18.66	6.31	83.11
Inanda	9	2.81	7.13	12.81	4.11	9.65	6.21	15.69	5.59	63.99
Lower Tugela	13	2.38	8.05	13.63	3.16	9.53	6.17	18.59	5.35	66.86
Mean: North Coast	22	2.56	7.67	13.29	3.55	9.59	6.18	17.39	5.45	65.68
Mean: South of Tugela	32	4.18	8.96	14.40	3.70	9.71	6.68	17.78	5.72	71.13
Mtunzini	5	3.26	7.78	13.57	3.06	9.38	9.40	18.26	5.70	70.41
Eshowe	3	1.97	6.78	12.24	2.31	6.73	6.55	18.96	4.23	59.77
Lower Umfolozi	8	4.68	8.27	12.79	3.72	8.69	11.12	18.27	3.60	71.14
Hlabisa	4	2.53	8.02	8.73	2.90	7.63	6.55	17.92	2.24	56.52
Ubombo	1	1.43	5.64	8.53	1.88	3.18	2.66	11.74	1.96	37.02
Piet Retief	1	0.04	5.48	10.71	0.72	2.01	3.18	17.29	2.73	42.16
Mean: Zululand and Piet Retief	22	3.25	7.67	11.86	3.01	7.83	8.53	17.96	3.80	63.91
Mean: General	54	3.80	8.44	13.36	3.42	8.95	7.42	17.86	4.94	68.19
Computed Mean for 42 years		4.21	6.14	23.05	4.84	4.21	6.14	23.05	4.84	76.46

TABLE V

Rainfall and Evaporation in Inches for the Past Four Years

Month	1962 - 1963			1963 - 1964			1964 - 1965			1965 - 1966		
	Evapora-tion	Rainfall	Rainfall Deficiency	Evapora-tion	Rainfall	Rainfall Deficiency	Evapora-tion	Rainfall	Rainfall Deficiency	Evapora-tion	Rainfall	Rainfall Deficiency
June	2.95	0.04	2.91	2.41	4.47	0.00	2.66	1.81	0.85	2.70	4.29	0.00
July	3.11	0.32	2.79	2.36	6.62	0.00	2.56	1.30	1.26	2.18	1.38	0.80
August	3.43	2.97	0.47	3.47	0.44	3.03	3.50	0.69	2.81	3.05	3.28	0.00
September	4.33	0.80	3.53	3.68	0.87	2.81	3.58	1.73	1.85	3.59	2.78	0.81
October	4.57	3.89	0.69	4.59	3.57	1.02	3.61	6.71	0.00	4.84	4.64	0.20
November	4.82	6.83	0.00	5.93	3.50	2.43	5.54	3.09	2.45	4.40	4.04	0.36
December	6.39	3.30	3.13	6.41	3.98	2.43	6.55	3.76	2.79	6.31	3.25	3.06
January	6.28	7.01	0.00	6.53	8.52	0.00	6.10	2.65	3.48	6.11	6.65	0.00
February	6.37	3.07	3.30	5.96	2.67	3.29	5.81	2.64	3.17	5.02	3.24	1.78
March	4.88	7.45	0.00	5.28	2.11	3.17	6.34	1.22	5.12	6.18	0.68	5.50
April	4.09	2.44	1.65	4.91	3.71	1.20	4.22	1.32	2.90	3.95	2.13	1.82
May	3.80	0.20	3.60	2.63	0.46	2.17	3.00	2.10	0.90	3.15	2.81	0.34
Total	55.02	38.32	22.07	54.16	40.92	21.55	53.47	29.02	27.55	51.48	39.17	14.67

TABLE VI

The following are the Screen Temperatures by Months in Degrees Fahrenheit at the Experiment Station for the Year June, 1965 to May, 1966, compared with the Means for the Period 1928 to 1966

Month	THIS PERIOD					AVERAGE 1928 TO 1966 INCLUSIVE			
	Maximum	Minimum	Mean	Plus or Minus Average	Daily Range	Maximum	Minimum	Mean	Daily Range
June	68.5	50.7	59.7	-3.1	17.8	72.8	52.7	62.8	20.1
July	70.7	52.3	61.5	-0.7	18.4	72.4	52.0	62.2	20.1
August	72.0	54.8	63.4	-0.2	17.1	73.2	53.7	63.6	19.5
September	73.4	59.0	66.2	+0.3	14.4	74.3	57.5	65.9	16.8
October	72.5	58.6	65.5	-2.8	13.9	75.6	61.0	68.3	14.6
November	73.9	62.7	67.2	-3.3	11.2	77.6	63.5	70.5	14.1
December	78.3	65.1	71.7	-1.1	13.2	79.8	65.8	72.8	14.0
January	81.9	69.8	75.8	+1.6	12.1	81.0	67.4	74.2	13.6
February	78.6	66.4	72.5	-2.1	12.2	81.5	67.7	74.6	13.8
March	82.0	65.7	73.9	+0.5	16.3	80.5	66.2	73.4	14.3
April	74.5	60.3	67.4	-2.7	14.2	78.0	62.1	70.1	15.9
May	73.8	56.5	65.1	-1.2	17.3	75.7	57.0	66.3	18.7
Mean	75.0	60.2	67.6	-1.1	14.8	76.9	60.5	68.7	16.4

TABLE VII

The following table gives the mean monthly earth temperatures

Month	Experiment Station 1935-66			Experiment Station June 1965 to May 1966		
	1 foot	2 feet	4 feet	1 foot	2 feet	4 feet
June	63.9	66.4	69.4	59.4	62.1	67.1
July	62.5	64.4	66.8	60.6	61.5	64.2
August	64.6	65.6	66.6	65.7	65.5	65.3
September	67.8	68.1	68.1	67.6	67.3	66.6
October	70.7	70.8	70.1	68.5	68.2	67.6
November	73.6	73.3	72.5	71.4	70.7	69.1
December	76.5	76.1	74.4	75.6	74.3	71.2
January	78.7	78.7	76.5	80.1	77.9	74.1
February	79.5	79.4	77.8	78.6	77.9	75.6
March	78.3	78.8	77.9	79.2	78.1	75.6
April	74.6	75.9	76.5	72.3	73.6	74.5
May	69.1	71.2	73.2	67.8	69.3	71.4
Mean	71.7	72.4	72.5	70.6	70.5	70.2

average. September, January and February were more cloudy than usual, with November being exceptionally overcast. The other four months had average hours of sunshine.

Wind

The anemometer in the meteorology site at the Experiment Station recorded 38,475 miles of air as having passed the site during the past year. This represents an average wind speed of 4.4 m.p.h. over the entire period. Based on figures for only two years, the wind pattern ranges from 3.2 m.p.h. for the month of July up to 5.8 m.p.h. for November and December.

Conclusions

Adverse growing conditions have been experienced by the South African sugar industry during the past two years. The winter of 1964 brought frost damage to many areas. Early spring was dry. Good rains fell in October, but from then until the end of May a very grave drought retarded cane growth tremendously. The winter of 1965 saw another, but less severe, bout of frost affect some cane fields. Spring and early summer were moist and cool. The first six or seven weeks of 1966 provided ideal cane growing weather. This deteriorated into a short severe autumn drought which was relieved only in May. Parts of Zululand however, were still dry at the end of that month.