



AGROMETEOROLOGICAL BULLETIN

July 2023
1st 10-day period

- Temperature
- Relative Humidity
- Soil Temperature
- Sunshine Duration
- Precipitation
- Evaporation
- Growing Degrees
- Reference Evapotranspiration
- Accumulated Rainfall from the beginning of wet period
- Accumulated Reference Evapotranspiration
- Number of dry days



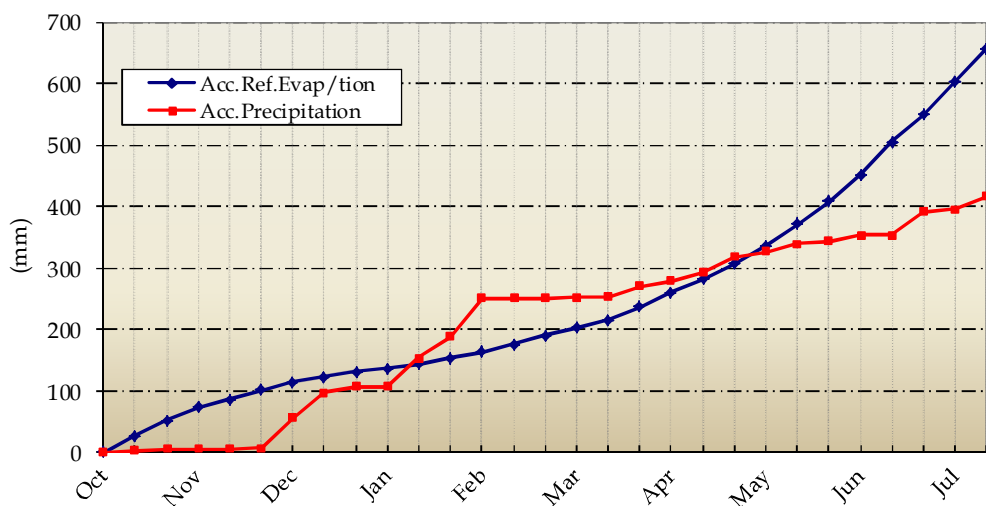
Hellenic National Meteorological Service
 Division of Climatology-Applications
 El. Venizelou Street 14, 16777
 Helliniko, Athens

Web adresses of HNMS
www.emy.gr
www.hnms.gr
www.emy.gov.gr
www.meteo.gov.gr
www.meteohellas.gr

1st 10-day period (1-10/07/2023)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	28.4	30.0	31.4	34.2	34.8	32.4	30.0	29.0	29.4	31.2	31.1	31.7	31.1
	Min	15.0	18.0	19.6	19.0	21.6	19.4	20.4	20.0	16.8	16.4	18.6	19.6	18.7
Relative Humidity	Max	91	84	89	92	86	83	85	87	82	84	86	81	78
	Min	48	36	47	40	32	37	46	51	48	38	42	34	37
Soil Temperature at 10 cm	06 UTC	23.2	24.6	25.6	24.6	25.0	24.6	25.2	24.0	23.2	24.3	24.4	26.7	25.6
	12 UTC	27.6	27.8	29.0	28.2	28.5	28.4	27.4	26.6	26.8	28.0	27.8	29.7	29.3
Sunshine Duration		13.8	12.7	6.4	13.6	13.5	9.1	7.7	6.7	13.3	13.4	11.0	11.0	11.3
Precipitation				14.7			2.7	1.7	0.8			19.9	0.0	6.8
Evaporation		6.0	10.0	5.4	8.7	9.3	6.0	6.7	5.0	8.5	6.3	71.9	92.7	90.5
Growing Degrees	5	16.7	19.0	20.5	21.6	23.2	20.9	20.2	19.5	18.1	18.8	198.5	206.2	178.9
	10	11.7	14.0	15.5	16.6	18.2	15.9	15.2	14.5	13.1	13.8	148.5	156.2	133.7

1st 10-day period (1-10/07/2023)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	53.5	60.3	46.4
Precipitation - Reference Evapotranspiration	-33.6	-60.3	-39.6
Number of Rainy Days	4.0	0.0	1.0
Number of Dry Days	3.0	14.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

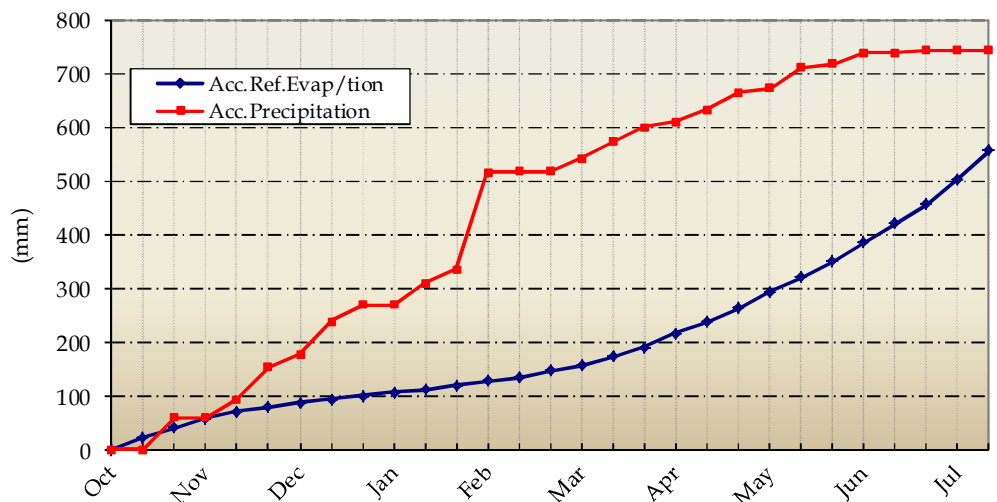


1st 10-day period (1-10/07/2023)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	30.4	29.9	28.9	31.2	31.0	31.4	31.8	31.6	32.9	32.5	31.2	33.3	30.4
	Min	19.9	19.0	22.5	19.2	20.6	20.2	20.3	20.6	18.8	18.6	20.0	20.2	18.8
Relative Humidity	Max	94	98	90	94	95	97	93	90	93	94	94	84	90
	Min	50	52	54	48	54	52	46	42	41	36	48	35	40
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	28.2
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	33.8
Sunshine Duration		12.9	10.9	13.0	13.1	11.2	13.1	13.5	13.7	12.7	12.7	12.7	12.7	12.6
Precipitation														0.3
Evaporation		-	-	-	-	-	-	-	-	-	-	-	-	84.0
Growing Degrees	5	20.2	19.5	20.7	20.2	20.8	20.8	21.1	21.1	20.9	20.6	205.7	217.6	158.6
	10	15.2	14.5	15.7	15.2	15.8	15.8	16.1	16.1	15.9	15.6	155.7	167.6	117.9

1st 10-day period (1-10/07/2023)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	52.7	53.1	43.0
Precipitation - Reference Evapotranspiration	-52.7	-53.1	-42.7
Number of Rainy Days	0.0	0.0	0.2
Number of Dry Days	23.0	30.0	-

The missing info in the tables are due to the absence of data.

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



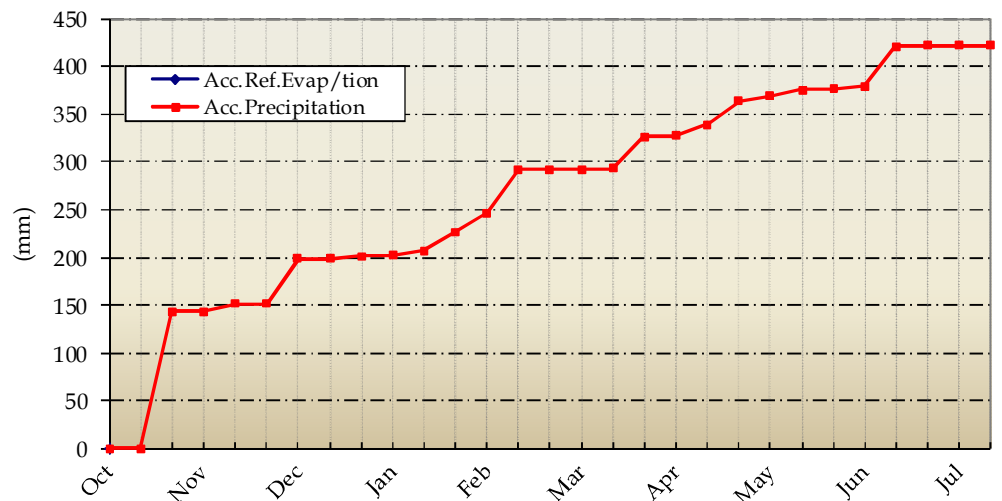
Iraklio

1st 10-day period (1-10/07/2023)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	27.8	30.4	29.0	28.6	29.8	30.0	31.2	30.6	28.8	28.6	29.5	28.6	29.3
	Min	20.8	20.0	21.8	24.0	21.6	22.6	22.8	23.6	25.4	20.6	22.3	23.5	22.1
Relative Humidity	Max	91	87	90	90	91	83	84	80	73	76	84	74	79
	Min	74	59	58	65	53	51	43	51	53	53	56	52	54
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
Sunshine Duration		12.7	12.5	12.6	12.8	12.7	12.8	12.9	13.5	12.8	12.9	12.8	12.1	12.6
Precipitation													0.0	0.1
Evaporation		3.8	5.0	4.8	5.8	8.2	4.6	8.7	7.0	9.6	9.8	67.3	75.3	69.0
Growing Degrees	5	19.3	20.2	20.4	21.3	20.7	21.3	22.0	22.1	22.1	19.6	209.0	210.4	191.9
	10	14.3	15.2	15.4	16.3	15.7	16.3	17.0	17.1	17.1	14.6	159.0	160.4	145.6

1st 10-day period (1-10/07/2023)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	-	-	
Precipitation - Reference Evapotranspiration	-	-	
Number of Rainy Days	0.0	0.0	0.0
Number of Dry Days	21.0	28.0	-

The missing info in the tables and the graph are due to the absence of data.

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

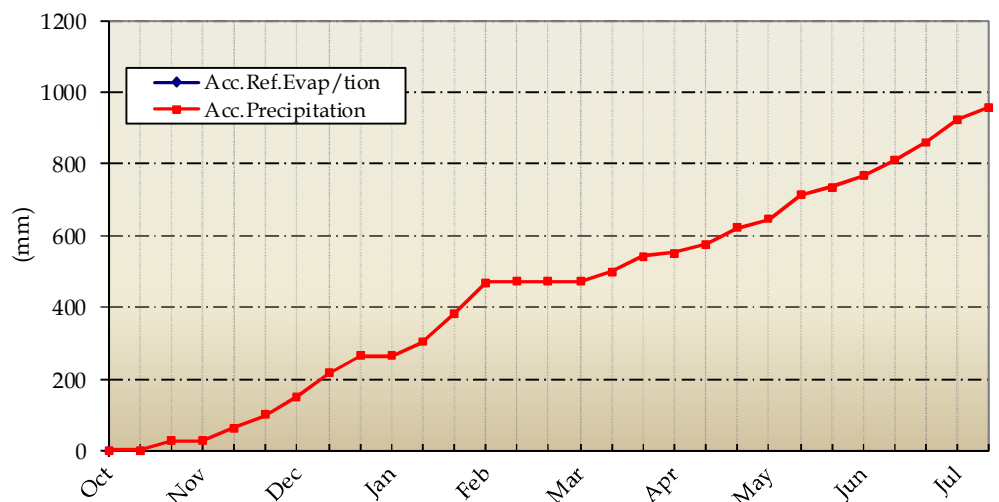


1st 10-day period (1-10/07/2023)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	29.2	27.6	30.9	30.9	30.3	31.7	31.4	30.7	31.6	31.1	30.5	32.8	31.3
	Min	12.7	17.3	14.3	17.1	17.2	14.3	15.7	13.8	14.1	14.6	15.1	15.7	15.5
Relative Humidity	Max	97	100	100	100	100	100	100	100	97	100	99	90	90
	Min	47	49	47	44	45	37	35	36	34	38	41	30	45
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	22.5
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	24.8
Sunshine Duration		11.9	5.2	12.1	10.4	4.6	11.2	13.2	13.1	13.1	13.0	10.8	10.7	10.8
Precipitation					33.6							33.6	15.4	5.7
Evaporation		-	-	-	-	-	-	-	-	-	-	-	-	
Growing Degrees	5	16.0	17.5	17.6	19.0	18.8	18.0	18.6	17.3	17.9	17.9	178.3	192.4	152.6
	10	11.0	12.5	12.6	14.0	13.8	13.0	13.6	12.3	12.9	12.9	128.3	142.4	110.9

1st 10-day period (1-10/07/2023)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	-	-	38.1
Precipitation - Reference Evapotranspiration	-	-	-32.4
Number of Rainy Days	1.0	2.0	1.1
Number of Dry Days	5.0	20.0	-

The missing info in the tables and the graph are due to the absence of data.

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

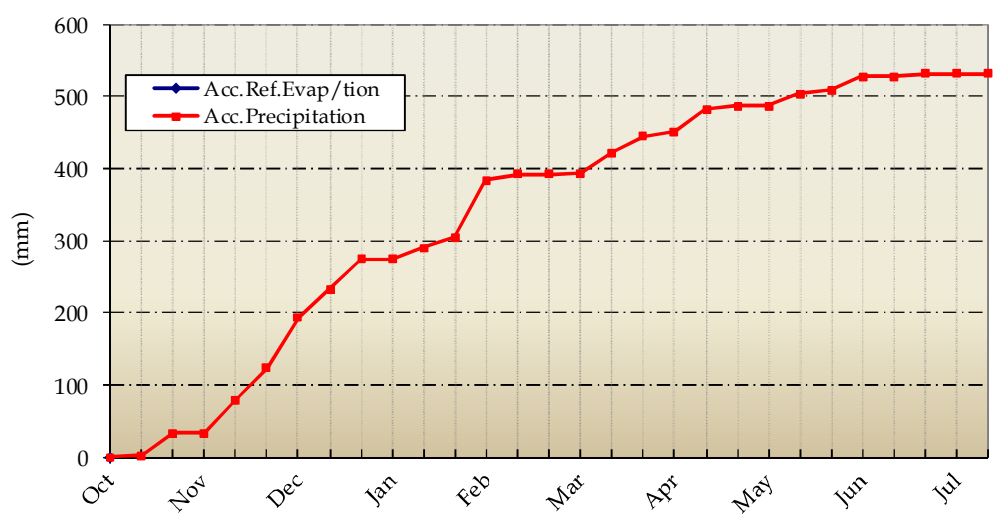


1st 10-day period (1-10/07/2023)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	32.3	29.8	32.5	31.9	32.8	32.9	37.5	36.3	31.9	32.7	33.1	33.0	31.7
	Min	18.6	17.9	22.6	20.5	23.0	22.3	21.6	23.2	18.9	17.7	20.6	18.9	18.7
Relative Humidity	Max	92	96	91	94	86	74	82	82	88	91	88	92	86
	Min	47	55	44	49	49	42	28	29	49	35	43	32	36
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	25.3
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	28.5
Sunshine Duration		12.4	11.1	12.6	10.0	11.8	12.6	12.7	12.8	12.3	12.4	12.1	12.6	11.9
Precipitation													0.0	1.3
Evaporation		-	-	-	-	-	-	-	-	-	-	-	-	73.2
Growing Degrees	5	20.5	18.9	22.6	21.2	22.9	22.6	24.6	24.8	20.4	20.2	218.5	209.2	177.4
	10	15.5	13.9	17.6	16.2	17.9	17.6	19.6	19.8	15.4	15.2	168.5	159.2	133.6

1st 10-day period (1-10/07/2023)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	-	-	39.7
Precipitation - Reference Evapotranspiration	-	-	-38.4
Number of Rainy Days	0.0	0.0	0.3
Number of Dry Days	22.0	20.0	-

The missing info in the tables and the graph are due to the absence of data.

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

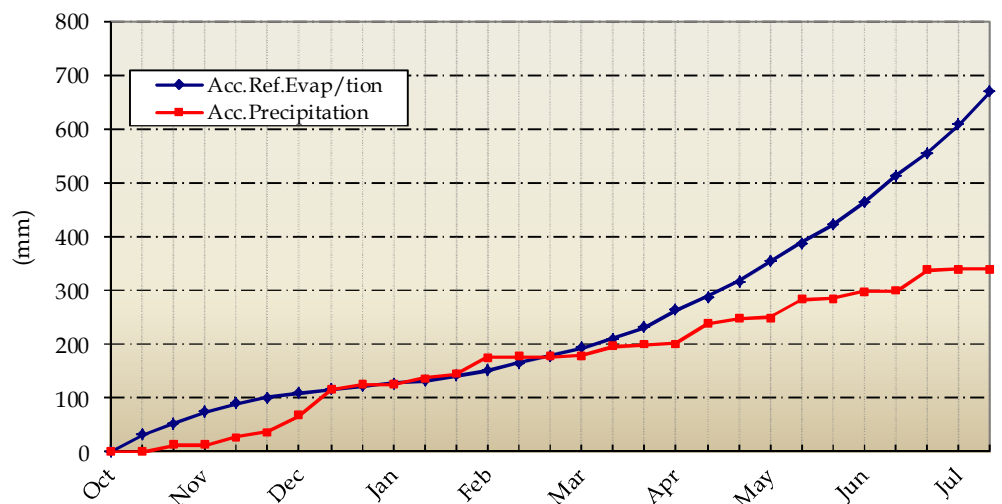


Larisa

1st 10-day period (1-10/07/2023)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	34.6	34.0	34.2	34.8	35.0	34.6	35.6	34.2	34.4	34.2	34.6	32.8	33.7
	Min	17.6	18.4	21.8	19.4	19.4	19.2	20.0	23.6	18.4	20.0	19.8	19.2	18.9
Relative Humidity	Max	97	95	81	83	82	91	89	56	67	62	80	85	79
	Min	28	29	31	29	32	33	23	28	22	22	28	33	27
Soil Temperature at 10 cm	06 UTC	28.0	28.4	28.6	29.0	29.2	29.2	29.4	30.0	30.0	29.6	29.1	27.4	26.8
	12 UTC	29.0	28.6	28.2	30.0	30.4	30.4	30.8	30.8	31.0	30.4	30.0	28.8	28.8
Sunshine Duration		10.5	6.6	9.0	11.2	8.0	9.8	10.6	10.9	11.8	10.4	9.9	8.8	10.8
Precipitation													30.9	5.2
Evaporation		-	-	-	-	-	-	-	-	-	-	-	101.0	109.2
Growing Degrees	5	21.1	21.2	23.0	22.1	22.2	21.9	22.8	23.9	21.4	22.1	221.7	209.8	188.0
	10	16.1	16.2	18.0	17.1	17.2	16.9	17.8	18.9	16.4	17.1	171.7	159.8	143.8

1st 10-day period (1-10/07/2023)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	59.6	57.7	58.2
Precipitation - Reference Evapotranspiration	-59.6	-26.8	-53.0
Number of Rainy Days	0.0	3.0	1.1
Number of Dry Days	14.0	8.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



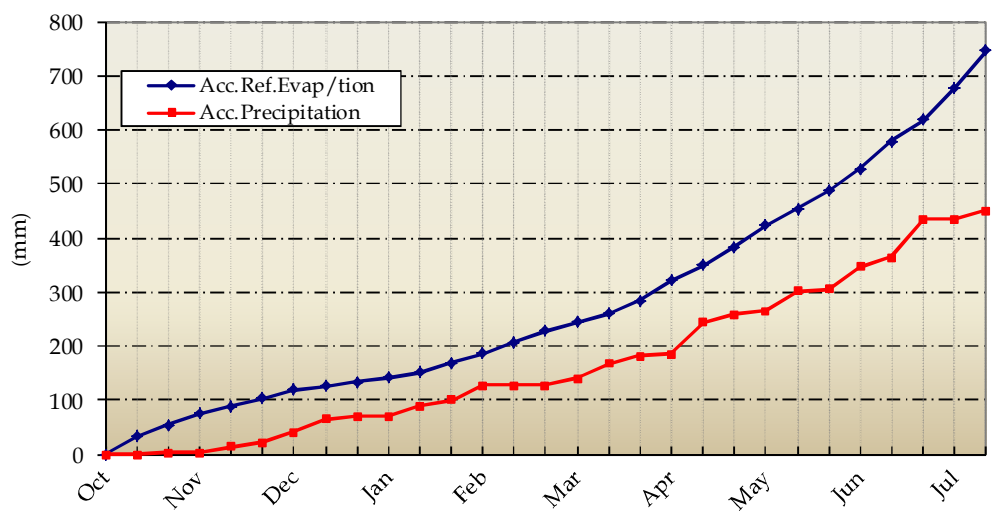


1st 10-day period (1-10/07/2023)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	30.7	29.8	32.6	34.1	32.4	32.4	34.0	30.9	31.6	31.8	32.0	31.7	32.1
	Min	19.4	18.6	22.8	20.9	21.3	20.0	22.5	23.4	19.0	18.6	20.6	22.2	20.4
Relative Humidity	Max	100	96	86	82	92	100	72	62	70	79	84	78	76
	Min	44	46	37	34	42	45	39	38	33	38	40	41	34
Soil Temperature at 10 cm	06 UTC	24.4	25.0	25.0	25.6	26.0	24.9	25.6	25.2	24.6	25.0	25.1	26.8	27.5
	12 UTC	27.6	27.6	28.8	28.6	28.6	27.8	30.4	28.0	29.8	30.8	28.8	29.0	32.6
Sunshine Duration		11.8	10.5	12.8	12.6	9.7	13.1	13.5	13.6	13.5	13.2	12.4	11.0	11.5
Precipitation			0.2	0.2		15.5						15.9	36.7	4.9
Evaporation		-	-	-	-	-	-	-	-	-	-	-	-	94.3
Growing Degrees	5	20.1	19.2	22.7	22.5	21.9	21.2	23.3	22.2	20.3	20.2	213.4	219.2	187.8
	10	15.1	14.2	17.7	17.5	16.9	16.2	18.3	17.2	15.3	15.2	163.4	169.2	143.5

1st 10-day period (1-10/07/2023)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	67.7	67.9	54.3
Precipitation - Reference Evapotranspiration	-51.8	-31.2	-49.4
Number of Rainy Days	3.0	2.0	1.2
Number of Dry Days	2.0	8.0	-

The missing info in the tables are due to the absence of data.

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



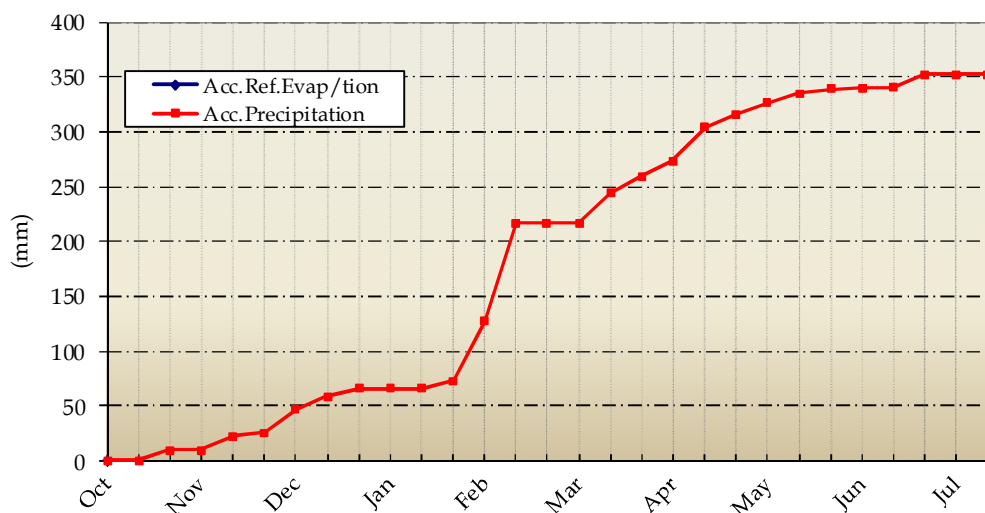
Tanagra

1st 10-day period (1-10/07/2023)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	32.0	34.7	32.6	33.4	33.3	33.2	35.2	31.6	31.7	32.1	33.0	31.2	32.4
	Min	18.4	18.5	21.5	19.8	19.4	21.1	21.0	23.9	20.9	17.7	20.2	19.9	19.4
Relative Humidity	Max	68	94	94	67	66	62	55	55	62	61	68	65	70
	Min	28	25	30	28	26	22	24	26	23	25	26	24	27
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
Sunshine Duration		12.6	12.3	12.8	12.8	12.5	13.2	13.4	12.8	13.4	12.9	12.9	12.5	11.9
Precipitation													26.8	3.0
Evaporation		-	-	-	-	-	-	-	-	-	-	-	-	85.5
Growing Degrees	5	20.2	21.6	22.1	21.6	21.4	22.2	23.1	22.8	21.3	19.9	216.0	205.7	176.4
	10	15.2	16.6	17.1	16.6	16.4	17.2	18.1	17.8	16.3	14.9	166.0	155.7	134.2

1st 10-day period (1-10/07/2023)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	-	-	
Precipitation - Reference Evapotranspiration	-	-	
Number of Rainy Days	0.0	2.0	0.5
Number of Dry Days	22.0	12.0	-

The missing info in the tables and the graph are due to the absence of data.

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

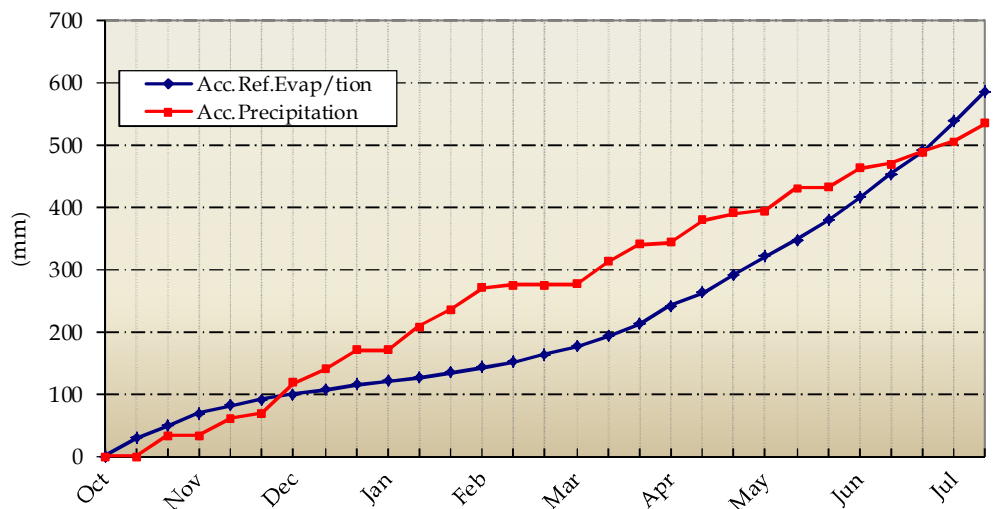


1st 10-day period (1-10/07/2023)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	29.8	29.9	29.2	31.0	31.9	31.6	33.6	31.9	31.5	30.7	31.1	31.2	31.2
	Min	12.3	13.8	15.2	17.5	15.4	13.9	14.5	15.2	14.4	13.7	14.6	15.1	14.2
Relative Humidity	Max	95	94	100	99	98	98	98	95	98	97	97	80	85
	Min	29	26	40	29	27	28	20	28	29	22	28	21	28
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	25.0
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	29.6
Sunshine Duration		12.4	13.1	6.7	8.1	8.0	9.7	12.2	10.9	12.3	12.6	10.6	10.6	10.8
Precipitation				28.5		1.3						29.8	12.2	7.9
Evaporation		-	-	-	-	-	-	-	-	-	-	-	-	53.0
Growing Degrees	5	16.1	16.9	17.2	19.3	18.7	17.8	19.1	18.6	18.0	17.2	178.5	181.6	140.9
	10	11.1	11.9	12.2	14.3	13.7	12.8	14.1	13.6	13.0	12.2	128.5	131.6	100.7

1st 10-day period (1-10/07/2023)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	48.8	53.6	45.0
Precipitation - Reference Evapotranspiration	-19.0	-41.4	-37.1
Number of Rainy Days	2.0	1.0	1.1
Number of Dry Days	5.0	9.0	-

The missing info in the tables are due to the absence of data.

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration





◆ **List of Symbols and Abbreviations**

Reference Evapotranspiration ETo (mm):

Calculated by the FAO Penman-Montieth equation

$$ET_0 = \frac{0.408 * \Delta * (R_n - G) + \gamma * \frac{900}{T + 273} * u_2 * (e_s - e_a)}{\Delta + \gamma * (1 + 0.34 * u_2)}$$

using 10-day step.

R_n is estimated from sunshine measurements and G assumed to be zero.

Growing Degrees: Degrees with mean temperature exceeding the base of 5 or 10 °C.

Number of Rainy Days: Number of days with precipitation of at least 0.1 mm.

Number of Dry Days: Number of dry days recorded since the last rainy day.

Past Years Mean Values 1991-2020 (Evaporation, Reference Evapotranspiration, Max and Min Relative Humidity 2005-2020)

Mesurements Units

- ◆ Temperature : °C
- ◆ Relative Humidity : %
- ◆ Soil Temperature : °C
- ◆ Sunshine Duration : Hours
- ◆ Precipitation : mm
- ◆ Evaporation (Pan) : mm
- ◆ Growing Degrees : °C

UTC (Universal Time coordinates) in Greece

- ◆ Winter : Time(UTC) = Local time - 2
- ◆ Summer : Time(UTC) = Local time - 3

© HELLENIC NATIONAL METEOROLOGICAL SERVICE
 Reproduction is prohibited without written permission
 El. Venizelou street 14, Zip Code 16777
 Helliniko, Athens

The present bulletin was designed and implemented under the support of Water Resources Management Division of Agriculture University of Athens