



# AGROMETEOROLOGICAL BULLETIN

*March 2023*  
*2nd 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  
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Helliniko, Athens

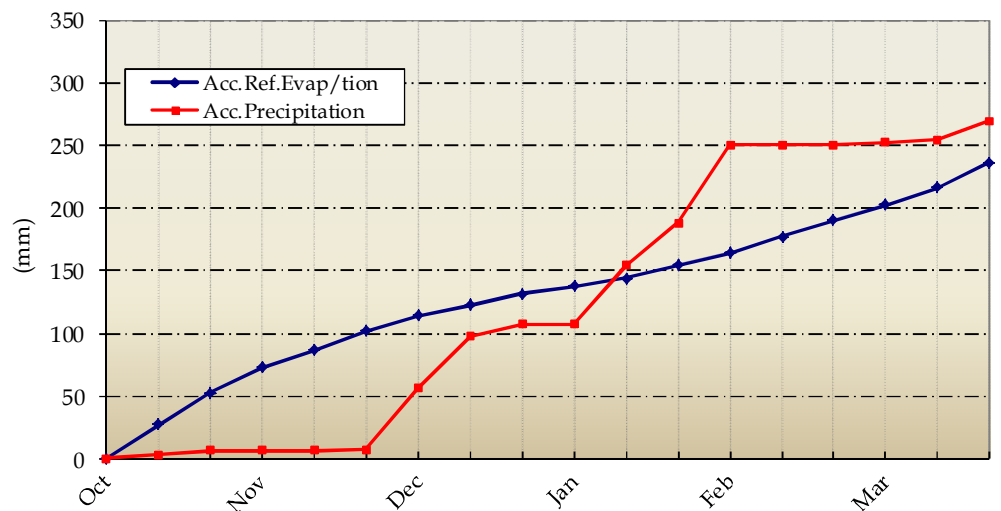
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Alexandroupoli

2nd 10-day period (11-20/03/2023)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	17.4	14.0	13.6	14.8	14.2	11.4	10.0	12.4	15.0	13.6	13.6	8.1	12.9
	Min	14.0	9.0	4.6	0.6	0.4	8.6	6.0	5.6	5.4	2.0	5.6	-1.5	3.5
Relative Humidity	Max	89	87	79	93	96	92	79	77	91	93	88	83	90
	Min	70	35	31	34	52	72	50	29	54	72	50	37	55
Soil Temperature at 10 cm	06 UTC	13.0	12.6	9.6	9.0	9.0	11.6	9.0	7.6	8.4	9.2	9.9	3.8	8.0
	12 UTC	14.0	12.2	11.4	12.6	12.4	12.4	8.8	10.2	11.4	12.6	11.8	7.0	10.3
Sunshine Duration		6.1	3.9	10.4	10.7	6.2	0.0	0.2	4.8	5.2	9.8	5.7	7.7	5.7
Precipitation		0.0	0.4			1.6	13.7					15.7	0.2	11.0
Evaporation		2.9	4.1	4.4	3.0	1.8	2.0	2.3	2.7	2.5	2.5	28.2	2.4	28.9
Growing Degrees	5	10.7	6.5	4.1	2.7	2.3	5.0	3.0	4.0	5.2	2.8	46.3	4.5	31.1
	10	5.7	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	7.4	0.0	5.1

2nd 10-day period (11-20/03/2023)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	20.1	18.8	12.0
Precipitation - Reference Evapotranspiration	-4.4	-18.6	-1.0
Number of Rainy Days	3.0	1.0	1.8
Number of Dry Days	5.0	9.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

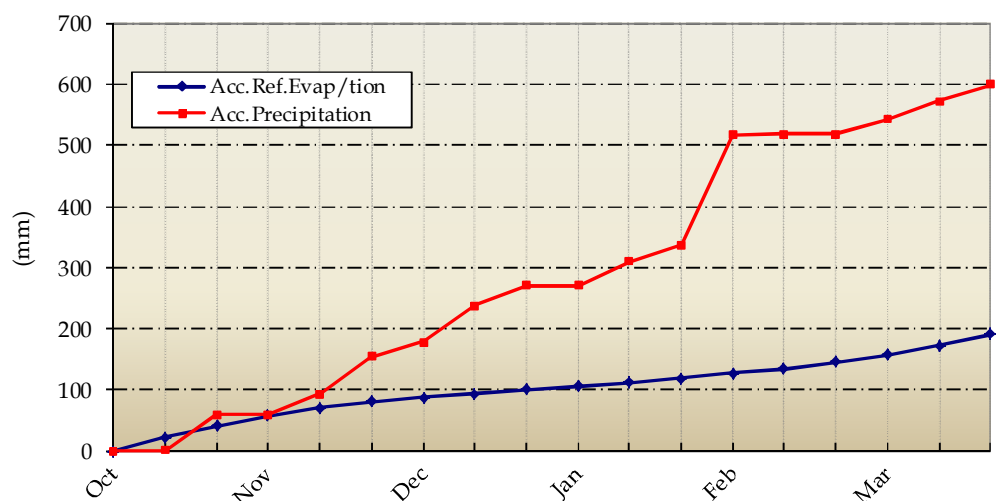


2nd 10-day period (11-20/03/2023)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	18.8	18.4	16.8	18.0	17.1	16.4	15.7	15.4	16.0	17.4	17.0	12.9	16.3
	Min	8.9	8.1	5.4	2.4	9.2	10.0	9.9	3.2	3.7	4.1	6.5	2.6	6.8
Relative Humidity	Max	95	98	84	89	92	98	96	94	96	97	94	89	91
	Min	55	50	39	35	57	63	49	43	41	62	49	39	49
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	11.5
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	14.4
Sunshine Duration		5.7	9.2	10.1	9.8	5.2	5.0	5.8	10.6	10.5	5.8	7.8	8.4	6.9
Precipitation						11.5	7.6	7.7				26.8		15.6
Evaporation		-	-	-	-	-	-	-	-	-	-	-	-	35.0
Growing Degrees	5	8.9	8.3	6.1	5.2	8.2	8.2	7.8	4.3	4.9	5.8	67.5	28.4	54.2
	10	3.9	3.3	1.1	0.2	3.2	3.2	2.8	0.0	0.0	0.8	18.3	4.1	15.3

2nd 10-day period (11-20/03/2023)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	19.1	17.4	17.5
Precipitation - Reference Evapotranspiration	7.7	-17.4	-1.9
Number of Rainy Days	3.0	0.0	2.2
Number of Dry Days	7.0	11.0	-

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

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



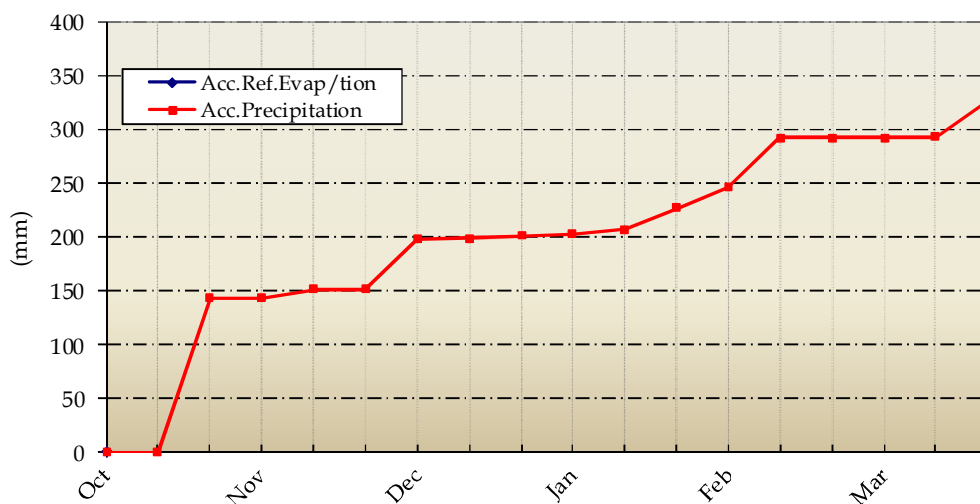
Iraklio

2nd 10-day period (11-20/03/2023)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	22.0	19.4	14.4	15.0	17.6	17.4	16.0	14.8	14.0	16.4	16.7	10.8	16.8
	Min	13.8	13.8	13.6	12.0	6.4	10.0	11.8	11.8	11.4	13.4	11.8	6.7	9.8
Relative Humidity	Max	85	94	85	83	88	93	95	88	83	90	88	77	84
	Min	51	70	50	60	58	64	75	64	65	72	63	47	53
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
Sunshine Duration		6.3	1.6	5.1	6.9	9.4	5.3	3.0	2.5	0.1	5.0	4.5	4.6	6.4
Precipitation			0.5	4.1			3.8	9.8	14.8	0.6		33.6	11.8	16.4
Evaporation		4.4	4.3	4.8	2.0	2.6	1.0	2.5	5.2	0.4	0.5	27.7	33.9	32.0
Growing Degrees	5	12.9	11.6	9.0	8.5	7.0	8.7	8.9	8.3	7.7	9.9	92.5	37.3	75.5
	10	7.9	6.6	4.0	3.5	2.0	3.7	3.9	3.3	2.7	4.9	42.5	5.4	30.5

2nd 10-day period (11-20/03/2023)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	-	-	-
Precipitation - Reference Evapotranspiration	-	-	-
Number of Rainy Days	6.0	4.0	2.7
Number of Dry Days	6.0	0.0	-

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

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

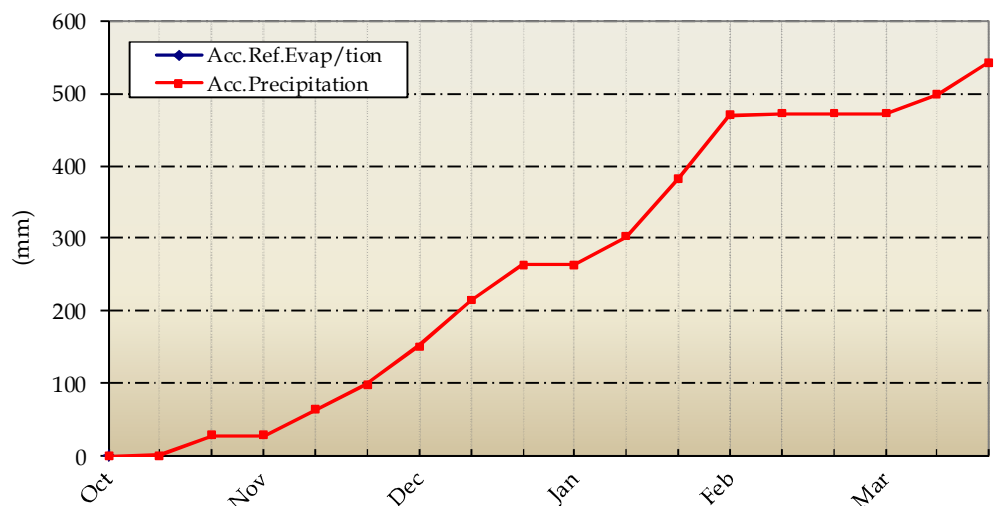


2nd 10-day period (11-20/03/2023)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	17.2	18.0	17.6	17.7	12.8	13.3	13.8	13.5	17.9	20.4	16.2	10.9	14.3
	Min	7.4	4.4	4.0	-1.8	3.4	5.9	4.5	-0.8	-0.5	1.0	2.8	-2.0	2.4
Relative Humidity	Max	100	100	96	100	100	100	86	93	100	100	98	80	94
	Min	60	27	18	25	62	47	35	41	32	29	38	31	47
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	7.4
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	8.1
Sunshine Duration		3.4	7.3	10.4	8.4	2.1	2.2	9.3	10.3	10.3	4.9	6.9	9.0	5.2
Precipitation		27.3				11.4	4.9	0.0				43.6		14.1
Evaporation		-	-	-	-	-	-	-	-	-	-	-	-	
Growing Degrees	5	7.3	6.2	5.8	3.0	3.1	4.6	4.2	1.4	3.7	5.7	44.9	9.5	27.2
	10	2.3	1.2	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.7	5.0	0.0	3.1

2nd 10-day period (11-20/03/2023)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	-	-	15.9
Precipitation - Reference Evapotranspiration	-	-	-1.8
Number of Rainy Days	3.0	0.0	2.1
Number of Dry Days	0.0	11.0	-

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

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

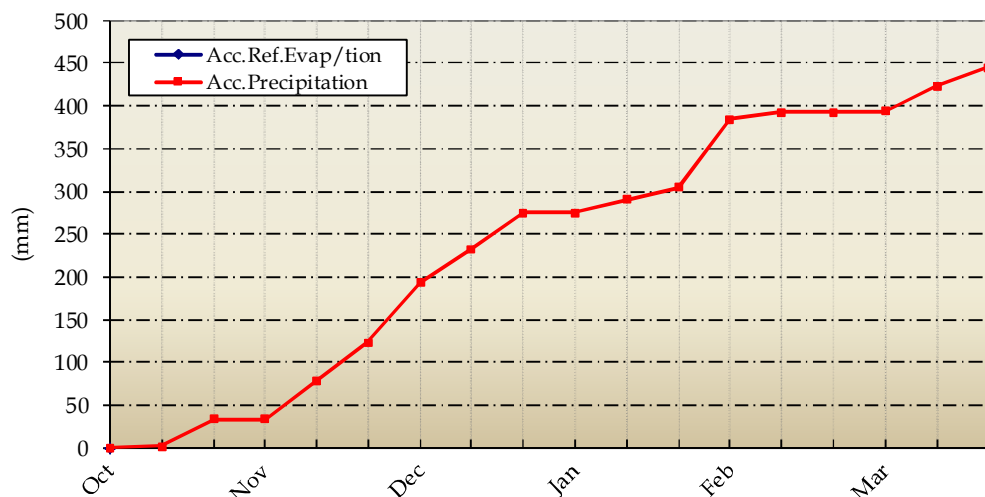


2nd 10-day period (11-20/03/2023)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	20.7	20.4	18.8	17.6	18.4	18.0	16.2	18.1	18.7	19.4	18.6	13.2	17.2
	Min	12.8	10.7	9.1	3.7	4.0	7.7	9.2	3.8	4.9	3.8	7.0	3.4	6.3
Relative Humidity	Max	97	95	75	92	96	97	98	90	92	95	93	78	92
	Min	46	61	35	42	60	62	43	33	28	42	45	39	46
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	9.8	11.6
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	10.8	13.3
Sunshine Duration		8.0	8.4	9.7	9.6	4.8	3.3	4.0	9.7	10.5	7.6	7.6	7.1	7.2
Precipitation		1.3				1.7	9.9	10.3				23.2	0.2	14.6
Evaporation		-	-	-	-	-	-	-	-	-	-	-	-	27.2
Growing Degrees	5	11.8	10.6	9.0	5.7	6.2	7.9	7.7	6.0	6.8	6.6	78.0	32.7	61.1
	10	6.8	5.6	4.0	0.7	1.2	2.9	2.7	1.0	1.8	1.6	28.0	3.9	18.1

2nd 10-day period (11-20/03/2023)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	-	-	19.6
Precipitation - Reference Evapotranspiration	-	-	-5.0
Number of Rainy Days	4.0	1.0	2.8
Number of Dry Days	0.0	3.0	-

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

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

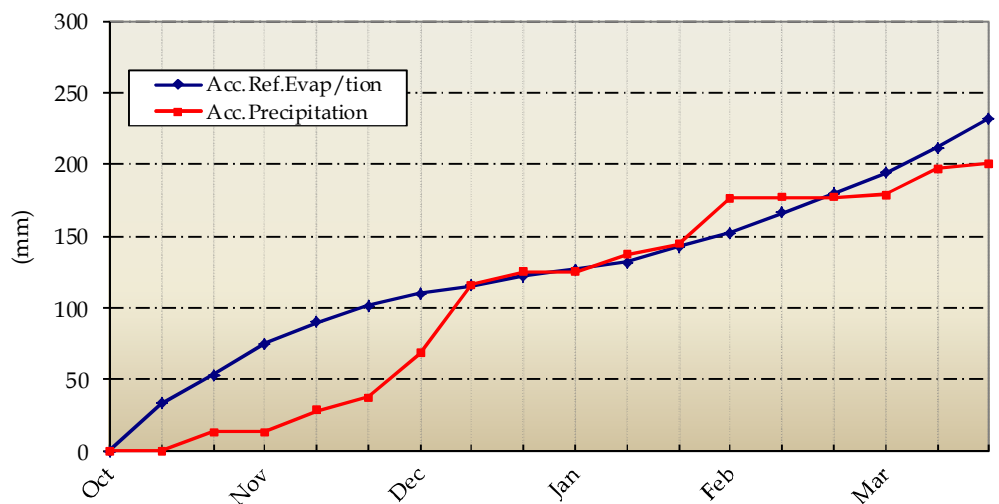


Larisa

2nd 10-day period (11-20/03/2023)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	20.6	16.0	14.0	16.4	13.6	12.8	12.4	13.6	16.8	20.0	15.6	10.2	15.8
	Min	10.0	5.6	5.0	-1.2	2.6	2.8	4.2	6.0	-0.8	-0.2	3.4	-1.1	3.4
Relative Humidity	Max	98	100	100	100	100	100	100	100	100	100	100	91	94
	Min	35	33	42	37	64	49	47	49	38	42	44	39	43
Soil Temperature at 10 cm	06 UTC	12.8	13.2	11.4	10.8	10.4	10.6	10.4	11.0	11.0	12.0	11.4	7.0	9.2
	12 UTC	13.6	13.2	11.8	11.4	11.8	11.6	11.2	12.0	11.4	12.0	12.0	7.3	10.4
Sunshine Duration		6.4	1.7	7.6	8.6	2.8	0.0	2.2	8.0	9.0	8.4	5.5	5.7	5.6
Precipitation		0.1	0.0			0.5	0.0	2.8				3.4	0.6	12.2
Evaporation		2.8	4.2	4.2	3.4	0.0	5.3	0.4	4.2	3.4	1.6	29.5	12.0	29.7
Growing Degrees	5	10.3	5.8	4.5	2.6	3.1	2.8	3.3	4.8	3.0	4.9	45.1	7.9	41.8
	10	5.3	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.1	0.0	9.3

2nd 10-day period (11-20/03/2023)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	20.7	18.9	23.9
Precipitation - Reference Evapotranspiration	-17.3	-18.3	-11.7
Number of Rainy Days	3.0	1.0	2.7
Number of Dry Days	4.0	8.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



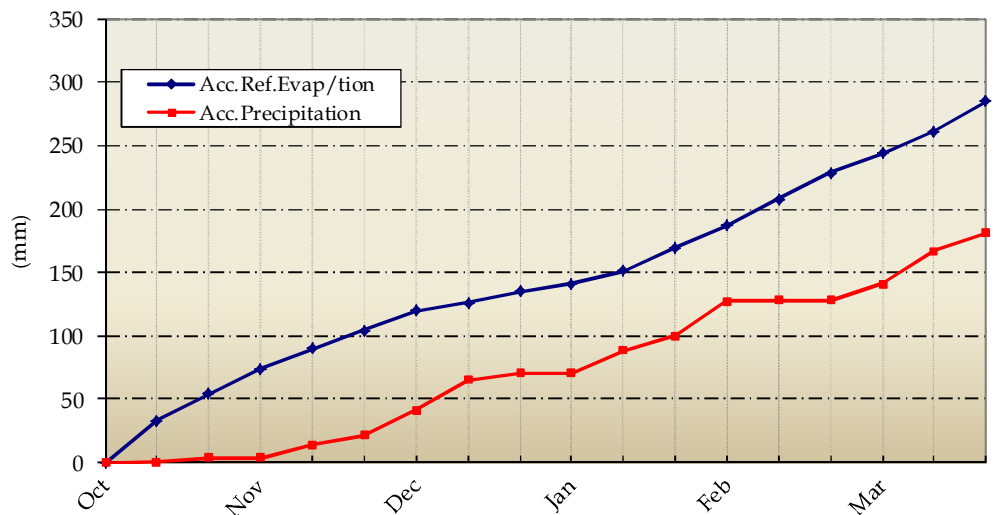
Mikra

2nd 10-day period (11-20/03/2023)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	20.3	16.8	14.2	15.4	12.0	11.8	14.3	13.4	16.0	16.6	15.1	10.1	14.7
	Min	10.1	9.0	3.8	2.4	4.0	7.6	4.3	7.9	0.9	3.1	5.3	-0.3	5.0
Relative Humidity	Max	100	81	88	97	100	100	95	92	97	100	95	89	86
	Min	40	35	33	50	71	55	48	49	37	59	48	35	45
Soil Temperature at 10 cm	06 UTC	12.8	11.4	10.4	9.6	10.2	10.2	8.2	10.0	9.0	9.8	10.2	6.2	9.1
	12 UTC	14.4	11.4	12.8	11.4	10.8	10.4	9.6	11.0	11.2	11.6	11.5	7.4	11.8
Sunshine Duration		5.7	5.3	9.0	10.9	0.0	0.2	7.1	4.7	11.0	8.9	6.3	6.9	6.3
Precipitation		3.1		0.0		0.7	0.5	9.5	0.5			14.3	14.0	9.6
Evaporation		-	-	-	-	-	-	-	-	-	-	-	-	29.8
Growing Degrees	5	10.2	7.9	4.0	3.9	3.0	4.7	4.3	5.7	3.5	4.9	52.0	9.9	41.8
	10	5.2	2.9	0.0	0.0	0.0	0.0	0.0	0.7	0.0	0.0	8.8	0.0	9.5

2nd 10-day period (11-20/03/2023)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	24.2	20.5	17.0
Precipitation - Reference Evapotranspiration	-9.9	-6.5	-7.4
Number of Rainy Days	5.0	2.0	2.2
Number of Dry Days	5.0	7.0	-

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

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration





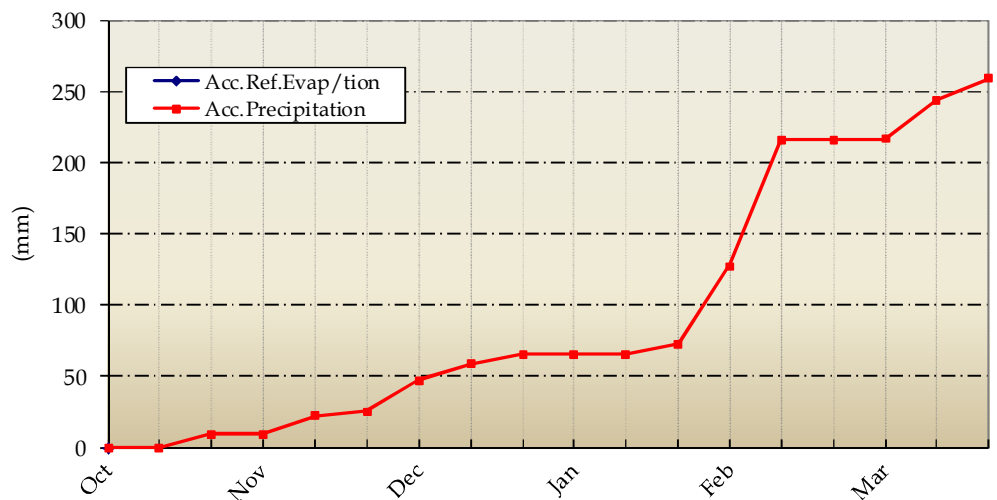
Tanagra

2nd 10-day period (11-20/03/2023)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	19.8	14.0	11.0	16.0	17.6	12.3	8.6	12.4	14.6	19.8	14.6	8.2	15.0
	Min	11.5	7.8	9.0	3.8	2.3	2.9	6.1	6.4	5.8	2.5	5.8	-0.4	4.9
Relative Humidity	Max	94	88	67	92	98	99	96	90	81	94	90	96	91
	Min	34	50	45	34	32	54	67	51	40	33	44	47	43
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
Sunshine Duration		8.0	5.4	3.2	10.4	3.4	0.8	0.0	2.3	8.2	9.1	5.1	4.3	6.3
Precipitation		3.6				1.3		10.1				15.0	22.6	16.6
Evaporation		-	-	-	-	-	-	-	-	-	-	-	-	28.3
Growing Degrees	5	10.7	5.9	5.0	4.9	5.0	2.6	2.4	4.4	5.2	6.2	52.1	7.9	41.9
	10	5.7	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.2	7.9	0.0	10.6

2nd 10-day period (11-20/03/2023)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	-	-	-
Precipitation - Reference Evapotranspiration	-	-	-
Number of Rainy Days	3.0	4.0	2.6
Number of Dry Days	4.0	0.0	-

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

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



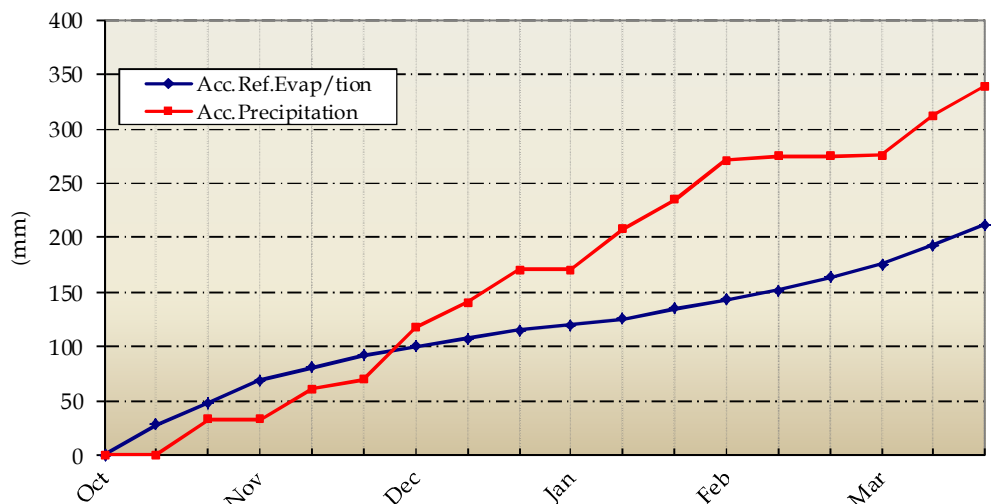
Tripoli

2nd 10-day period (11-20/03/2023)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	16.2	16.2	9.8	16.8	13.2	13.8	7.6	13.0	15.4	19.3	14.1	7.9	13.8
	Min	10.2	4.6	5.2	-2.6	0.8	4.0	4.0	-0.9	-0.2	-1.5	2.4	-2.5	1.4
Relative Humidity	Max	100	100	98	100	100	97	96	98	98	99	99	89	91
	Min	48	51	53	-	67	53	69	46	29	24	49	41	42
Soil Temperature at 10 cm	06 UTC	10.6	9.8	8.6	6.2	7.2	8.0	8.6	6.0	7.0	6.8	7.9	-	7.1
	12 UTC	12.8	13.4	12.2	12.4	10.2	11.2	8.8	11.2	12.6	13.2	11.8	-	9.4
Sunshine Duration		5.8	4.8	8.0	10.2	5.4	2.2	0.9	8.2	10.0	7.7	6.3	5.9	6.6
Precipitation		2.4	6.0			6.2	1.2	11.8				27.6	0.3	15.5
Evaporation		2.5	3.1	2.5	2.3	-	1.7	0.8	0.4	2.6	1.5	-	-	55.8
Growing Degrees	5	8.2	5.4	2.5	2.1	2.0	3.9	0.8	1.1	2.6	3.9	32.5	3.4	24.6
	10	3.2	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.6	0.0	3.7

2nd 10-day period (11-20/03/2023)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	18.9	14.9	19.3
Precipitation - Reference Evapotranspiration	8.7	-14.6	-3.8
Number of Rainy Days	5.0	1.0	2.7
Number of Dry Days	0.0	0.0	-

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

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