



AGROMETEOROLOGICAL BULLETIN

December 2022
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
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Helliniko, Athens

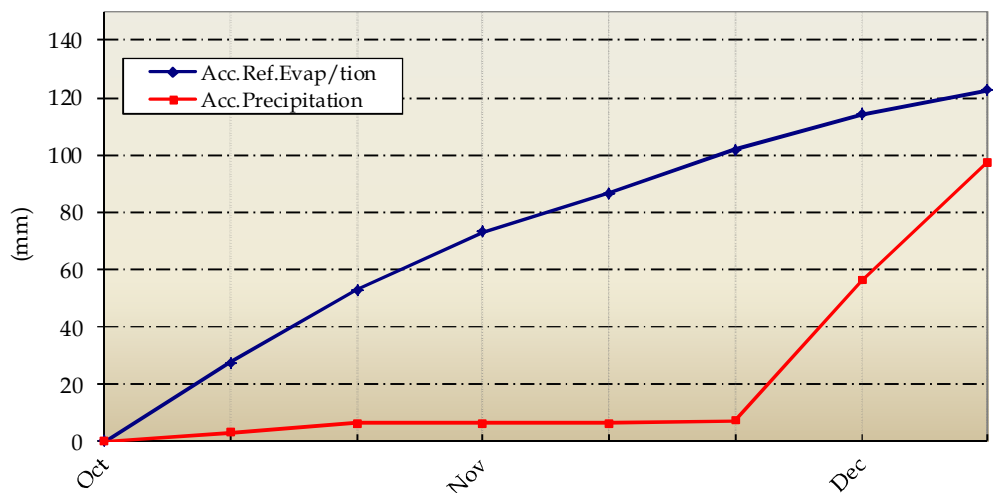
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www.emy.gr
www.hnms.gr
www.emy.gov.gr
www.meteo.gov.gr
www.meteohellas.gr

Alexandroupoli

1st 10-day period (1-10/12/2022)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	11.4	11.4	11.6	11.8	12.6	14.4	14.6	16.0	16.4	18.4	13.9	15.6	11.8
	Min	9.6	9.0	7.6	8.4	8.0	8.0	7.0	12.2	12.4	13.0	9.5	7.6	4.6
Relative Humidity	Max	95	97	91	89	87	92	95	95	98	93	93	91	91
	Min	80	80	74	67	61	59	68	80	91	67	73	68	62
Soil Temperature at 10 cm	06 UTC	11.0	10.6	10.6	10.6	10.4	10.6	11.0	12.8	13.0	15.0	11.6	10.9	8.6
	12 UTC	10.8	10.8	11.4	11.0	11.2	12.0	12.0	13.4	14.0	15.2	12.2	12.5	9.7
Sunshine Duration		0.0	0.0	0.2	0.0	0.0	1.8	0.6	0.3	0.2	0.0	0.3	3.8	3.4
Precipitation		8.5	16.8					0.5	15.4			41.2	51.3	21.8
Evaporation		3.3	1.4	0.9	1.7	2.0	0.9	2.0	1.0	1.5	0.2	14.9	17.1	10.5
Growing Degrees	5	5.5	5.2	4.6	5.1	5.3	6.2	5.8	9.1	9.4	10.7	66.9	66.1	34.5
	10	0.5	0.2	0.0	0.1	0.3	1.2	0.8	4.1	4.4	5.7	17.3	20.3	9.6

1st 10-day period (1-10/12/2022)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	8.6	10.3	7.5
Precipitation - Reference Evapotranspiration	32.6	41.0	14.3
Number of Rainy Days	4.0	5.0	2.8
Number of Dry Days	1.0	3.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

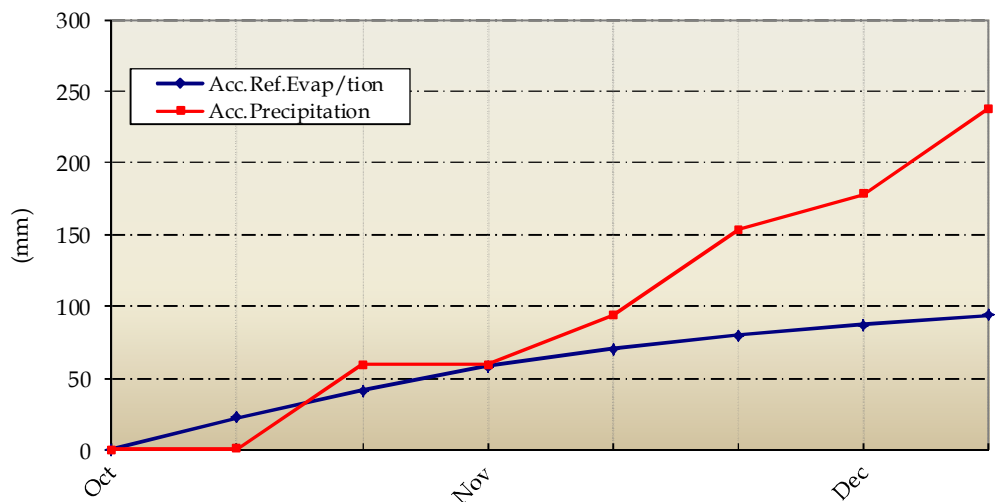


1st 10-day period (1-10/12/2022)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	17.2	18.8	20.2	17.5	19.6	14.9	18.2	19.3	19.6	20.6	18.6	16.9	16.4
	Min	11.4	8.4	9.3	10.4	10.6	12.5	12.2	9.4	10.0	16.3	11.0	9.3	7.9
Relative Humidity	Max	99	99	92	94	97	98	99	99	97	94	97	95	91
	Min	80	66	49	70	65	91	60	64	67	60	67	59	55
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	13.6	11.6
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	14.3	13.6
Sunshine Duration		1.4	5.9	3.2	0.6	4.3	0.0	2.8	1.8	2.4	0.5	2.3	3.7	4.6
Precipitation		33.6				2.3	11.6	12.0			0.6	60.1	103.6	35.4
Evaporation		-	-	-	-	-	-	-	-	-	-	-	9.0	23.9
Growing Degrees	5	9.3	8.6	9.8	9.0	10.1	8.7	10.2	9.4	9.8	13.5	98.2	80.9	58.5
	10	4.3	3.6	4.8	4.0	5.1	3.7	5.2	4.4	4.8	8.5	48.2	30.9	20.1

1st 10-day period (1-10/12/2022)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	6.6	6.6	9.4
Precipitation - Reference Evapotranspiration	53.5	97.0	26.0
Number of Rainy Days	5.0	10.0	3.4
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



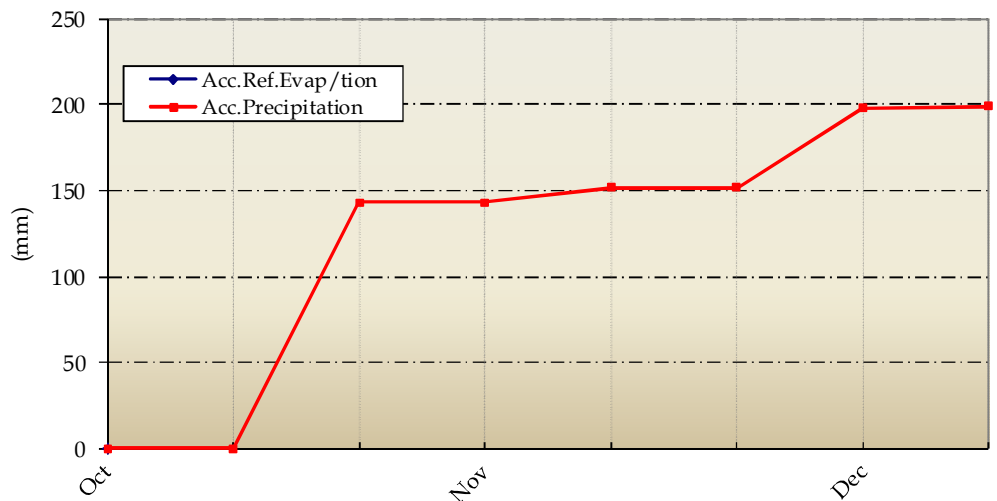
Iraklio

1st 10-day period (1-10/12/2022)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	21.0	20.2	18.6	17.6	17.8	17.2	19.8	22.0	20.4	22.6	19.7	18.5	18.2
	Min	15.0	4.2	12.8	12.0	12.2	14.8	10.6	15.4	13.8	13.4	12.4	12.6	12.1
Relative Humidity	Max	87	95	95	93	85	88	88	91	93	93	91	82	85
	Min	60	64	77	68	71	69	62	65	72	56	66	51	58
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
Sunshine Duration		7.8	8.4	3.7	6.5	8.4	4.6	5.8	6.5	7.9	6.1	6.6	5.2	4.5
Precipitation		0.9		0.0		0.0	0.0					0.9	33.4	27.4
Evaporation		1.7	2.9	0.1	0.7	2.0	1.1	3.2	1.2	1.4	2.4	16.7	28.6	37.1
Growing Degrees	5	13.0	7.2	10.7	9.8	10.0	11.0	10.2	13.7	12.1	13.0	110.7	105.5	96.3
	10	8.0	2.2	5.7	4.8	5.0	6.0	5.2	8.7	7.1	8.0	60.7	55.5	49.0

1st 10-day period (1-10/12/2022)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	-	-	-
Precipitation - Reference Evapotranspiration	-	-	-
Number of Rainy Days	1.0	6.0	3.6
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

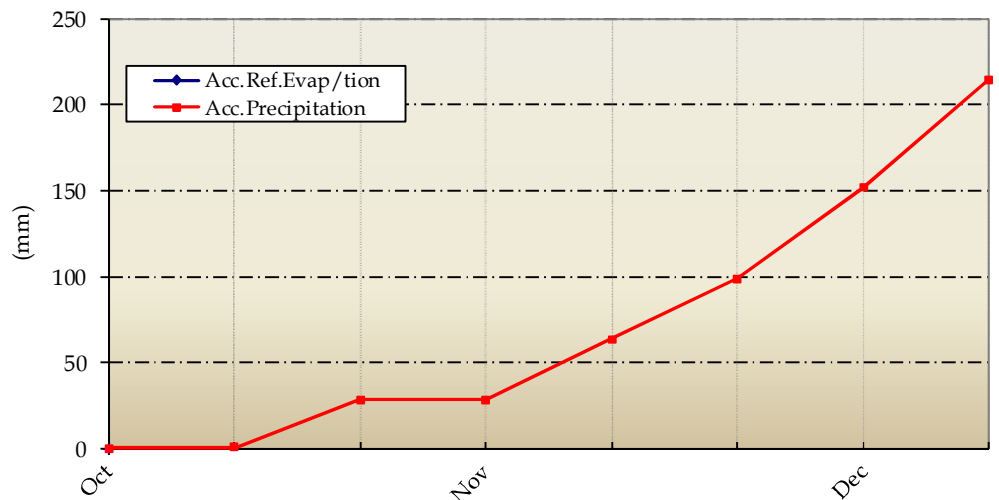


1st 10-day period (1-10/12/2022)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	12.4	14.6	13.3	10.7	13.7	14.2	12.6	14.8	14.9	14.3	13.6	10.5	11.2
	Min	7.6	7.6	1.5	7.3	7.9	6.7	6.3	9.0	10.2	10.8	7.5	3.7	2.4
Relative Humidity	Max	95	100	100	100	100	100	100	100	100	100	100	99	98
	Min	62	56	65	91	82	74	78	62	85	65	72	76	67
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	6.4
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	6.9
Sunshine Duration		1.5	5.0	1.3	0.1	0.3	2.8	3.2	1.5	0.0	0.0	1.6	2.2	2.3
Precipitation		0.6			8.0	7.8		0.1	5.5	20.9	20.5	63.4	129.1	45.7
Evaporation		-	-	-	-	-	-	-	-	-	-	-	-	-
Growing Degrees	5	5.0	6.1	2.4	4.0	5.8	5.5	4.5	6.9	7.6	7.6	55.2	23.4	18.8
	10	0.0	1.1	0.0	0.0	0.8	0.5	0.0	1.9	2.6	2.6	9.4	0.2	2.3

1st 10-day period (1-10/12/2022)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	-	-	8.1
Precipitation - Reference Evapotranspiration	-	-	37.6
Number of Rainy Days	7.0	8.0	3.4
Number of Dry Days	0.0	1.0	-

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

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

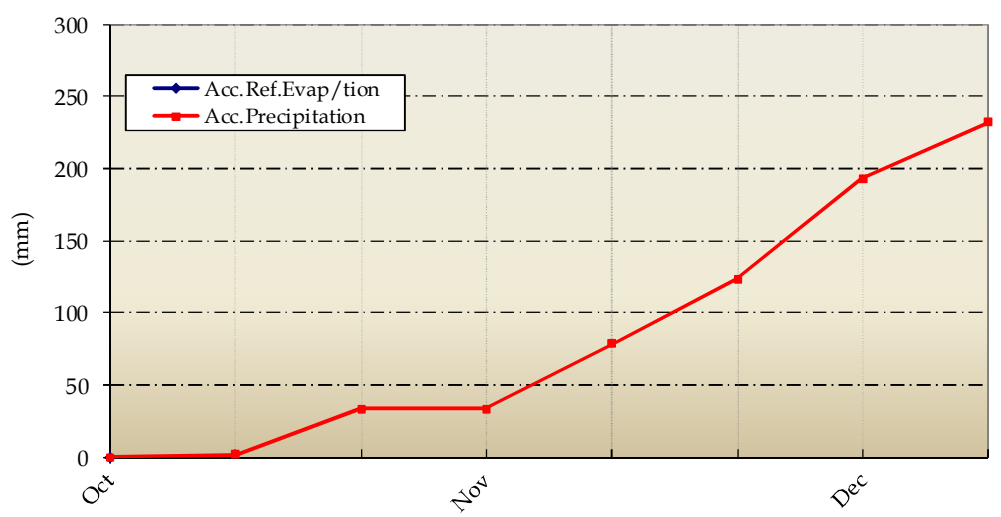


1st 10-day period (1-10/12/2022)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	17.9	20.6	19.8	20.1	20.4	19.0	16.4	20.0	20.9	20.1	19.5	17.6	17.6
	Min	10.6	6.6	9.1	9.0	10.5	8.9	9.5	9.4	9.3	13.3	9.6	8.2	7.5
Relative Humidity	Max	99	98	96	96	98	98	99	98	98	97	98	96	94
	Min	70	50	51	53	55	58	80	66	49	70	60	59	54
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	13.2	12.6
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	13.9	13.5
Sunshine Duration		1.1	8.0	3.0	4.5	6.7	2.0	1.0	3.8	6.2	1.0	3.7	5.0	5.1
Precipitation		32.3	0.0		0.0			6.2			0.4	38.9	50.2	41.4
Evaporation		-	-	-	-	-	-	-	-	-	-	-	-	18.4
Growing Degrees	5	9.3	8.6	9.5	9.6	10.5	9.0	8.0	9.7	10.1	11.7	95.7	79.4	67.1
	10	4.3	3.6	4.5	4.6	5.5	4.0	3.0	4.7	5.1	6.7	45.7	29.7	23.7

1st 10-day period (1-10/12/2022)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	-	-	10.2
Precipitation - Reference Evapotranspiration	-	-	31.2
Number of Rainy Days	3.0	9.0	4.0
Number of Dry Days	0.0	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

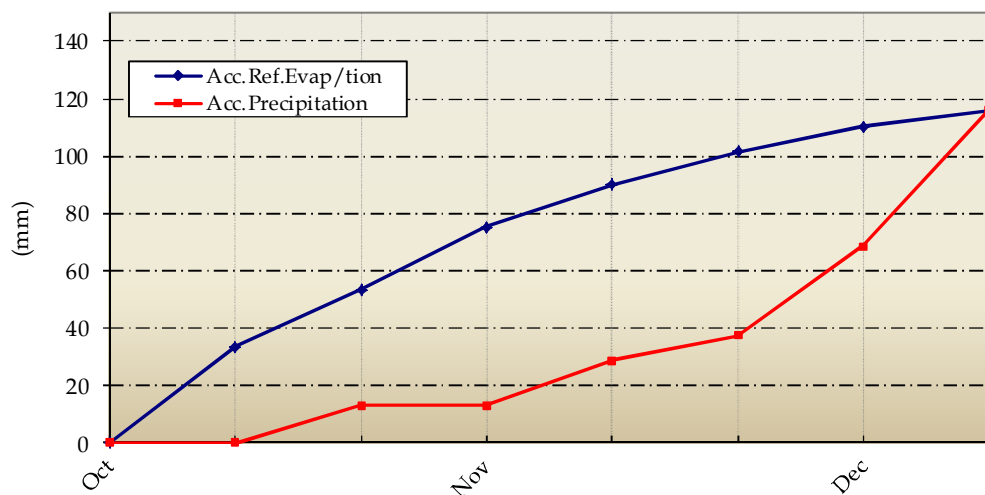


Larisa

1st 10-day period (1-10/12/2022)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	12.4	14.2	12.7	13.0	13.2	14.6	14.8	14.6	15.8	17.6	14.3	13.4	12.7
	Min	8.6	4.6	6.2	10.2	10.6	10.8	10.8	8.6	7.0	10.8	8.8	4.0	3.8
Relative Humidity	Max	100	100	100	100	100	100	100	100	100	100	100	98	97
	Min	94	69	85	91	92	76	86	94	89	75	85	61	61
Soil Temperature at 10 cm	06 UTC	11.0	11.2	11.4	11.0	11.6	13.0	12.8	13.0	12.8	13.4	12.1	8.6	9.4
	12 UTC	11.4	11.8	12.0	12.0	13.0	13.6	13.4	13.2	13.2	13.0	12.7	10.1	10.0
Sunshine Duration		0.0	4.3	0.0	0.0	0.0	1.1	0.2	0.5	0.9	0.1	0.7	4.2	3.6
Precipitation		40.6				3.5		2.8	0.7	0.1		47.7	37.9	15.6
Evaporation		0.9	2.3	1.4	0.0	0.2	1.2	0.8	0.6	0.5	0.0	7.9	17.8	10.9
Growing Degrees	5	5.5	4.4	4.5	6.6	6.9	7.7	7.8	6.6	6.4	9.2	65.6	37.0	31.2
	10	0.5	0.0	0.0	1.6	1.9	2.7	2.8	1.6	1.4	4.2	16.7	0.4	5.8

1st 10-day period (1-10/12/2022)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	5.6	7.4	7.5
Precipitation - Reference Evapotranspiration	42.1	30.5	8.1
Number of Rainy Days	5.0	5.0	3.3
Number of Dry Days	0.0	2.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



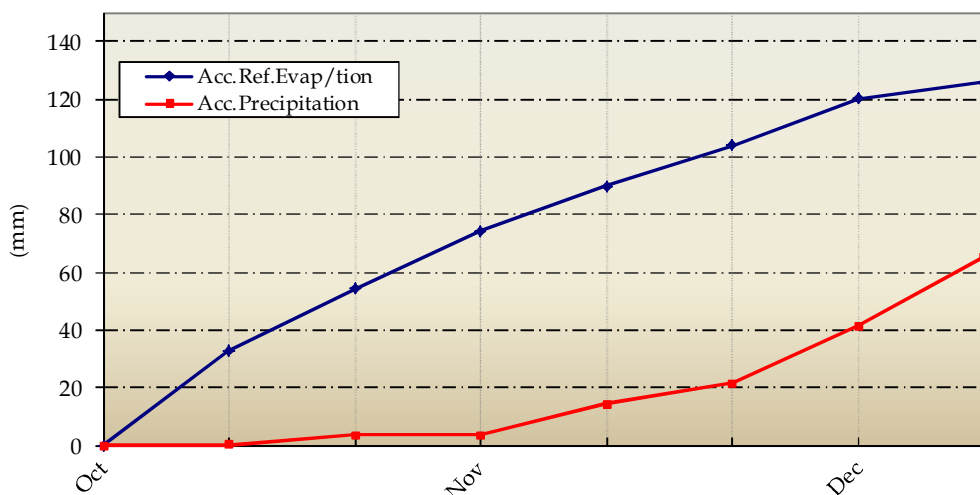
Mikra

1st 10-day period (1-10/12/2022)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	13.1	14.7	12.6	14.2	12.8	13.6	12.8	14.0	14.4	17.4	14.0	14.0	12.4
	Min	11.4	7.4	7.9	10.5	10.5	10.4	9.7	9.4	11.0	12.4	10.1	5.2	5.2
Relative Humidity	Max	99	100	100	100	100	100	100	100	100	100	100	94	90
	Min	76	64	90	67	82	78	93	93	94	65	80	59	58
Soil Temperature at 10 cm	06 UTC	12.1	12.0	11.8	12.6	12.6	12.8	12.9	12.8	13.2	13.2	12.6	10.3	8.8
	12 UTC	12.2	12.8	12.8	13.2	13.2	13.4	13.4	13.4	13.8	13.8	13.2	11.3	10.7
Sunshine Duration		0.0	7.4	0.0	0.0	0.0	0.7	0.0	0.0	0.6	0.5	0.9	5.3	3.7
Precipitation		20.9	0.2	0.0		1.2		0.8			0.9	24.0	22.2	17.0
Evaporation		-	-	-	-	-	-	-	-	-	-	-	-	29.2
Growing Degrees	5	7.3	6.1	5.3	7.4	6.7	7.0	6.3	6.7	7.7	9.9	70.1	46.1	36.6
	10	2.3	1.1	0.3	2.4	1.7	2.0	1.3	1.7	2.7	4.9	20.1	7.3	7.3

1st 10-day period (1-10/12/2022)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	5.9	11.3	6.6
Precipitation - Reference Evapotranspiration	18.1	10.9	10.4
Number of Rainy Days	5.0	5.0	2.7
Number of Dry Days	0.0	2.0	-

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

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



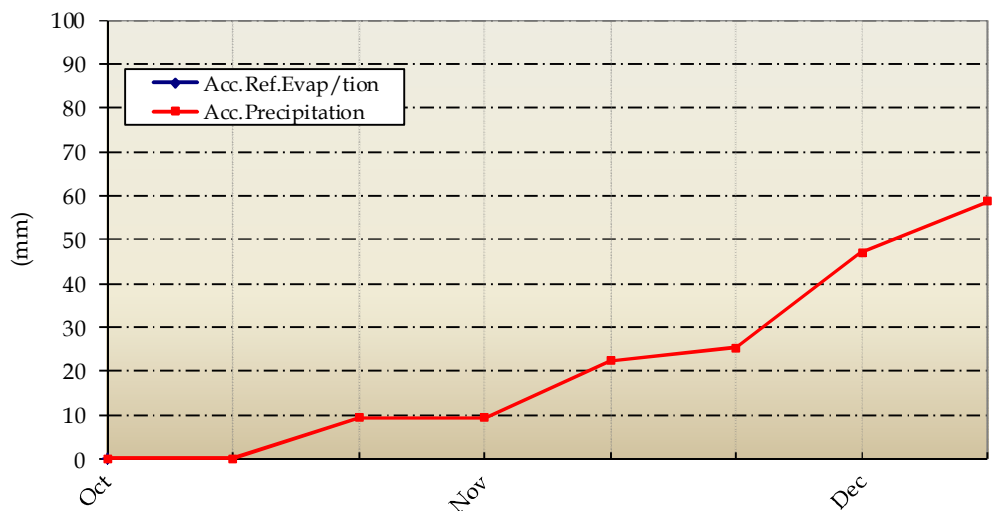
Tanagra

1st 10-day period (1-10/12/2022)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	16.4	16.6	15.5	15.3	14.0	15.9	17.6	19.0	20.2	19.0	17.0	16.6	14.4
	Min	9.6	8.1	7.6	7.6	8.5	9.0	8.0	7.8	8.4	15.4	9.0	6.4	6.5
Relative Humidity	Max	100	98	98	98	94	95	99	99	99	77	96	92	93
	Min	57	56	66	58	64	55	60	60	55	54	58	45	53
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
Sunshine Duration		2.4	7.1	3.5	2.6	0.6	3.7	3.1	5.5	5.0	0.0	3.4	5.4	4.3
Precipitation		10.4				0.0		0.3	0.9			11.6	21.9	23.2
Evaporation		-	-	-	-	-	-	-	-	-	-	-	-	23.8
Growing Degrees	5	8.0	7.4	6.6	6.5	6.3	7.5	7.8	8.4	9.3	12.2	79.8	65.0	47.2
	10	3.0	2.4	1.6	1.5	1.3	2.5	2.8	3.4	4.3	7.2	29.8	19.3	12.2

1st 10-day period (1-10/12/2022)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	-	-	-
Precipitation - Reference Evapotranspiration	-	-	-
Number of Rainy Days	3.0	5.0	3.2
Number of Dry Days	0.0	2.0	-

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

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



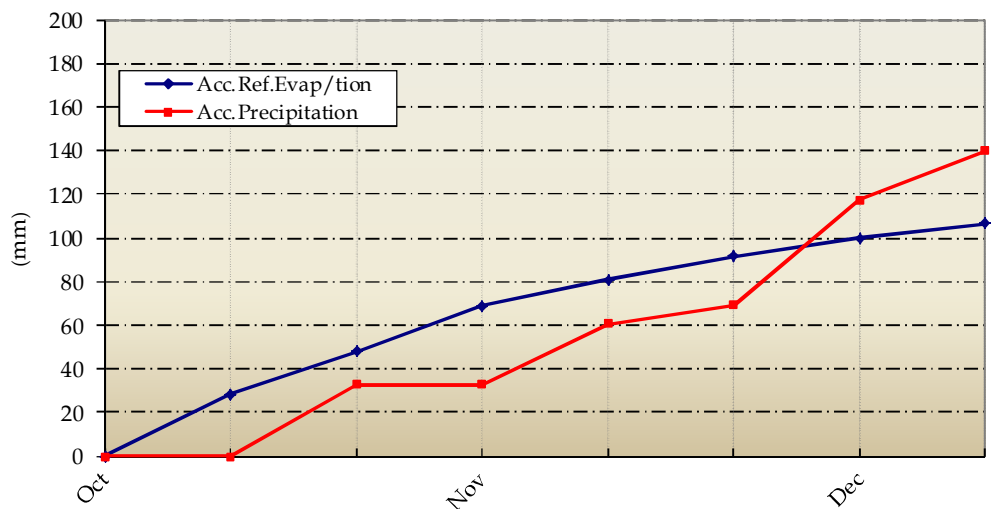
Tripoli

1st 10-day period (1-10/12/2022)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	11.2	14.9	10.8	13.1	14.2	12.5	13.5	16.3	17.1	16.6	14.0	12.5	12.1
	Min	6.6	2.7	4.7	6.2	8.5	8.4	5.4	6.0	4.8	11.7	6.5	3.9	2.3
Relative Humidity	Max	99	99	98	99	97	97	98	99	100	92	98	96	99
	Min	76	59	89	68	70	76	59	58	60	60	68	54	57
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	7.2
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	8.7
Sunshine Duration		0.2	6.1	0.0	2.1	2.1	0.5	0.3	4.8	3.9	2.1	2.2	4.5	4.6
Precipitation		20.2	0.5	0.6	0.0	0.9				0.1	0.4	22.7	48.3	24.8
Evaporation		-	-	-	-	-	-	-	-	-	-	-	-	39.5
Growing Degrees	5	3.9	3.8	2.8	4.7	6.4	5.5	4.5	6.2	6.0	9.2	52.6	32.2	21.9
	10	0.0	0.0	0.0	0.0	1.4	0.5	0.0	1.2	1.0	4.2	8.1	1.0	2.5

1st 10-day period (1-10/12/2022)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	6.8	8.1	5.3
Precipitation - Reference Evapotranspiration	15.9	40.2	19.5
Number of Rainy Days	6.0	6.0	3.4
Number of Dry Days	0.0	2.0	-

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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