



# AGROMETEOROLOGICAL BULLETIN

*November 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



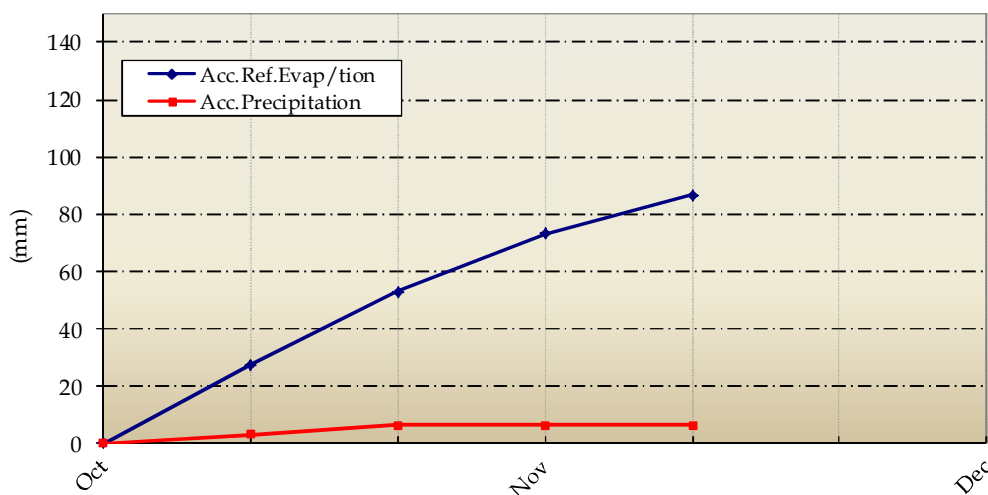
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*Web adresses of HNMS*  
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1st 10-day period (1-10/11/2022)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	23.4	21.0	24.8	20.6	22.0	22.6	20.0	19.4	18.0	18.8	21.1	18.7	17.3
	Min	7.0	6.8	7.6	9.2	7.6	10.6	13.0	6.4	6.4	5.4	8.0	10.5	8.1
Relative Humidity	Max	90	95	95	95	95	95	84	91	92	94	93	94	90
	Min	45	51	35	53	60	45	49	46	52	40	48	64	57
Soil Temperature at 10 cm	06 UTC	15.4	15.6	15.4	16.0	15.4	16.0	16.4	14.2	14.3	13.4	15.2	14.6	12.6
	12 UTC	18.8	18.4	18.6	18.4	18.5	17.4	17.6	16.8	16.4	16.2	17.7	16.5	14.4
Sunshine Duration		8.7	8.4	7.1	8.1	8.5	0.9	4.7	6.5	5.8	8.0	6.7	4.3	5.5
Precipitation													15.5	18.8
Evaporation		2.5	2.3	2.1	3.6	1.0	0.9	2.8	2.6	3.0	1.0	21.8	15.8	23.6
Growing Degrees	5	10.2	8.9	11.2	9.9	9.8	11.6	11.5	7.9	7.2	7.1	95.3	95.9	72.3
	10	5.2	3.9	6.2	4.9	4.8	6.6	6.5	2.9	2.2	2.1	45.3	45.9	30.8

1st 10-day period (1-10/11/2022)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	13.7	12.2	11.7
Precipitation - Reference Evapotranspiration	-13.7	3.3	7.1
Number of Rainy Days	0.0	2.0	1.5
Number of Dry Days	26.0	14.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

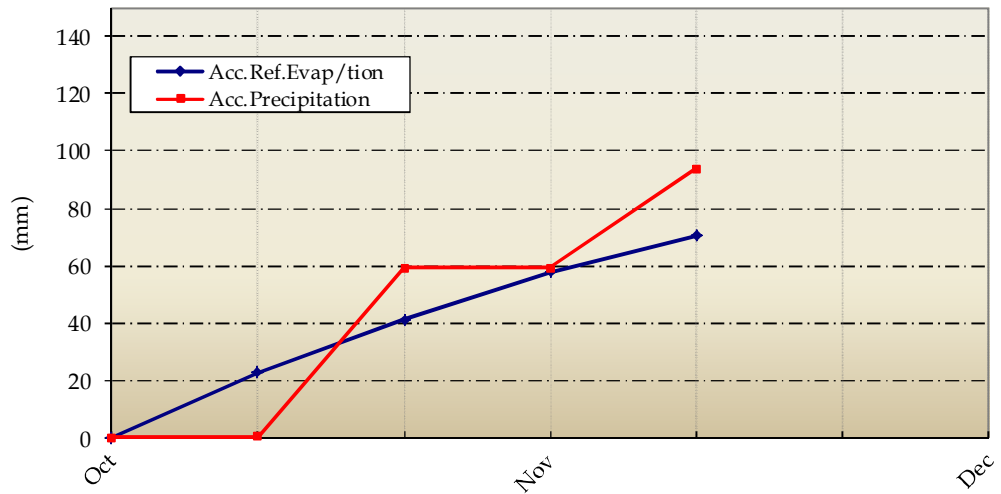


1st 10-day period (1-10/11/2022)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	25.7	25.1	23.8	25.0	22.9	19.3	21.8	21.0	21.4	21.3	22.7	24.6	21.1
	Min	9.4	8.9	12.4	13.1	14.0	12.4	10.2	9.4	9.2	8.1	10.7	12.9	11.0
Relative Humidity	Max	94	96	97	95	98	99	99	98	98	98	97	97	92
	Min	38	41	64	54	58	61	55	64	58	58	55	51	50
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	17.4	15.4
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	19.3	18.4
Sunshine Duration		9.5	9.2	9.5	9.4	5.9	2.2	9.3	9.2	8.3	8.7	8.1	5.7	5.9
Precipitation						20.0	10.8	3.7				34.5	5.0	29.5
Evaporation		-	-	-	-	-	-	-	-	-	-	-	15.6	38.3
Growing Degrees	5	12.6	12.0	13.1	14.1	13.5	10.9	11.0	10.2	10.3	9.7	117.2	137.6	93.5
	10	7.6	7.0	8.1	9.1	8.5	5.9	6.0	5.2	5.3	4.7	67.2	87.6	51.4

1st 10-day period (1-10/11/2022)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	12.6	12.4	15.4
Precipitation - Reference Evapotranspiration	21.9	-7.4	14.1
Number of Rainy Days	3.0	1.0	2.2
Number of Dry Days	20.0	7.0	-

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

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

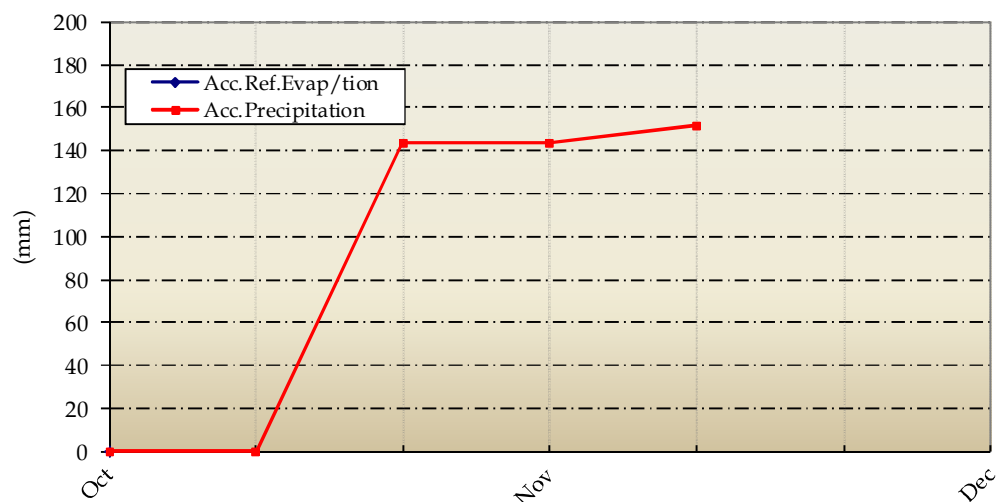


1st 10-day period (1-10/11/2022)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	21.4	21.8	22.8	22.6	25.2	24.2	19.4	19.8	20.2	20.0	21.7	22.3	22.0
	Min	12.6	13.6	14.4	13.0	13.2	16.8	15.2	17.8	17.4	16.4	15.0	15.9	15.2
Relative Humidity	Max	88	89	94	86	82	90	93	79	79	89	87	92	86
	Min	70	64	56	57	46	52	72	65	64	70	62	70	60
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
Sunshine Duration		8.7	9.1	9.1	9.0	8.8	4.8	5.2	6.8	8.2	7.0	7.7	6.4	5.4
Precipitation								8.4				8.4		18.9
Evaporation		3.5	2.7	2.4	1.6	1.8	2.9	6.6	4.0	2.1	3.6	31.2	22.9	35.6
Growing Degrees	5	12.0	12.7	13.6	12.8	14.2	15.5	12.3	13.8	13.8	13.2	133.9	141.4	131.6
	10	7.0	7.7	8.6	7.8	9.2	10.5	7.3	8.8	8.8	8.2	83.9	91.4	82.8

1st 10-day period (1-10/11/2022)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	-	-	-
Precipitation - Reference Evapotranspiration	-	-	-
Number of Rainy Days	1.0	0.0	2.4
Number of Dry Days	20.0	10.0	-

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

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



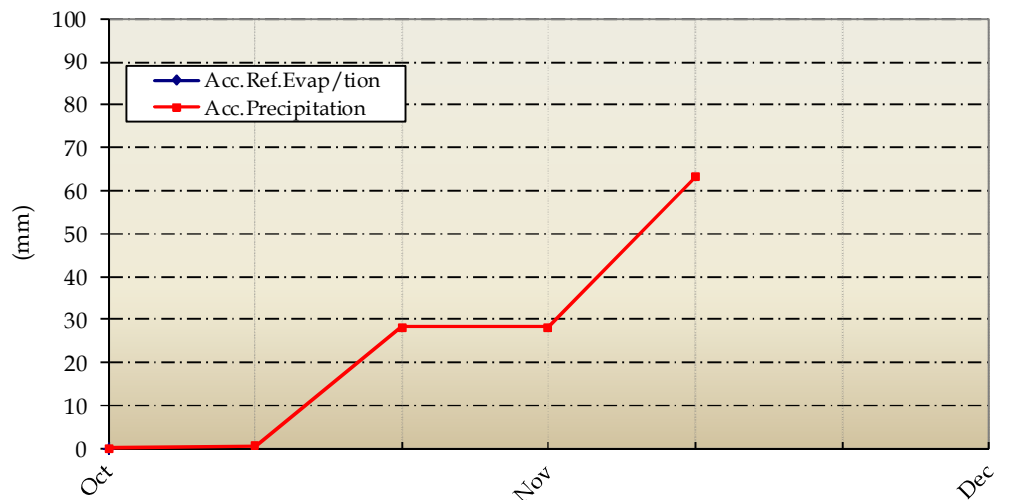
Ioannina

1st 10-day period (1-10/11/2022)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	25.2	25.2	25.4	22.8	17.5	18.3	21.6	19.5	19.7	19.2	21.4	21.8	17.1
	Min	4.4	3.5	4.8	2.4	11.1	9.8	8.2	3.7	4.6	4.4	5.7	9.2	5.8
Relative Humidity	Max	100	100	100	100	93	100	100	100	100	100	99	98	98
	Min	33	39	36	35	66	68	39	59	50	62	49	49	56
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	10.8
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	11.4
Sunshine Duration		8.7	9.5	8.2	7.9	0.5	4.0	8.7	5.9	5.4	5.6	6.4	5.2	3.8
Precipitation						19.0	16.2					35.2	15.6	39.6
Evaporation		-	-	-	-	-	-	-	-	-	-	-	-	
Growing Degrees	5	9.8	9.4	10.1	7.6	9.3	9.1	9.9	6.6	7.2	6.8	85.7	104.7	54.6
	10	4.8	4.4	5.1	2.6	4.3	4.1	4.9	1.6	2.2	1.8	35.7	56.6	17.8

1st 10-day period (1-10/11/2022)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	-	-	10.1
Precipitation - Reference Evapotranspiration	-	-	29.5
Number of Rainy Days	2.0	1.0	2.9
Number of Dry Days	20.0	8.0	-

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

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



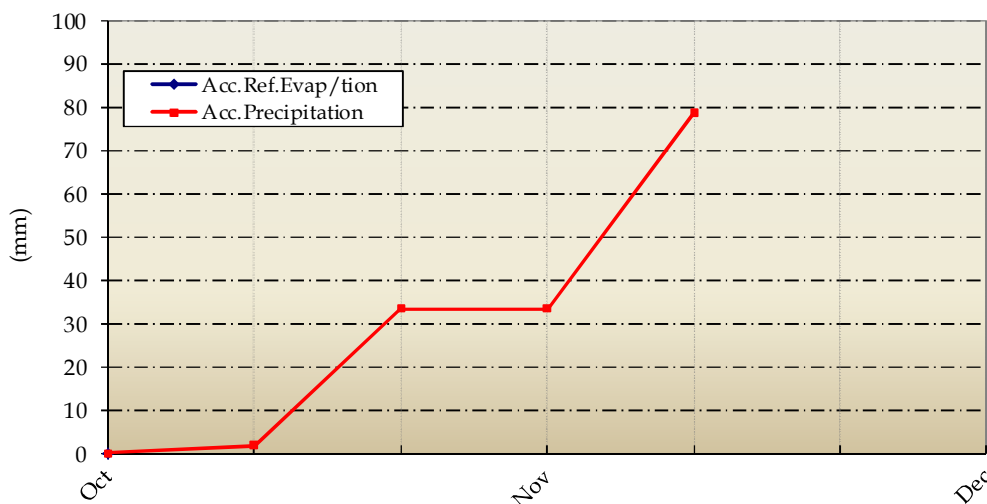
Kalamata

1st 10-day period (1-10/11/2022)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	27.4	24.6	26.0	26.0	23.3	20.9	22.2	22.3	22.8	22.8	23.8	24.5	22.0
	Min	10.4	7.9	9.7	9.0	8.2	12.8	10.9	10.1	9.7	9.4	9.8	12.5	10.7
Relative Humidity	Max	95	94	96	93	98	99	95	96	96	97	96	96	91
	Min	28	35	30	31	53	66	47	53	47	52	44	55	47
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	16.9	16.1
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	19.6	17.5
Sunshine Duration		9.5	9.3	8.1	9.2	7.5	2.5	9.1	9.0	9.0	8.9	8.2	5.5	6.5
Precipitation						7.5	37.7					45.2	14.2	27.7
Evaporation		-	-	-	-	-	-	-	-	-	-	-	-	26.8
Growing Degrees	5	13.9	11.3	12.9	12.5	10.8	11.9	11.6	11.2	11.3	11.1	118.2	-	103.1
	10	8.9	6.3	7.9	7.5	5.8	6.9	6.6	6.2	6.3	6.1	68.2	-	57.9

1st 10-day period (1-10/11/2022)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	-	-	19.3
Precipitation - Reference Evapotranspiration	-	-	8.4
Number of Rainy Days	2.0	1.0	2.3
Number of Dry Days	20.0	6.0	-

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

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

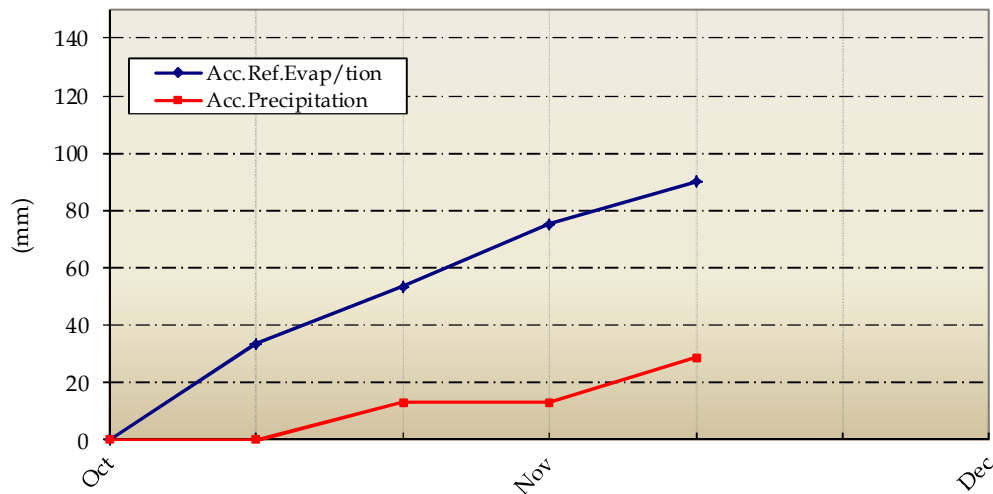


Larisa

1st 10-day period (1-10/11/2022)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	25.6	26.0	26.8	24.8	24.4	19.0	21.4	20.2	20.0	21.0	22.9	19.7	18.5
	Min	6.2	7.2	7.0	8.0	5.0	12.0	12.2	7.8	8.6	10.8	8.5	9.2	7.4
Relative Humidity	Max	89	86	93	100	100	100	100	100	100	100	97	99	96
	Min	34	32	27	39	35	76	52	62	57	47	46	64	52
Soil Temperature at 10 cm	06 UTC	15.8	16.2	16.4	16.8	16.4	17.4	16.8	15.8	15.6	15.8	16.3	14.2	13.6
	12 UTC	17.4	17.8	17.8	18.0	18.0	17.8	17.8	18.2	18.4	18.2	17.9	16.4	14.4
Sunshine Duration		8.1	8.2	8.1	7.3	6.3	0.2	6.4	5.8	5.7	5.7	6.2	4.0	4.3
Precipitation							9.8	5.8				15.6	0.2	11.7
Evaporation		8.6	6.5	4.9	2.1	4.8	0.3	1.9	4.7	3.2	0.8	37.8	15.0	29.2
Growing Degrees	5	10.9	11.6	11.9	11.4	9.7	10.5	11.8	9.0	9.3	10.9	107.0	94.2	75.3
	10	5.9	6.6	6.9	6.4	4.7	5.5	6.8	4.0	4.3	5.9	57.0	44.2	30.4

1st 10-day period (1-10/11/2022)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	14.7	11.6	9.6
Precipitation - Reference Evapotranspiration	0.9	-11.4	2.1
Number of Rainy Days	2.0	1.0	2.0
Number of Dry Days	22.0	7.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



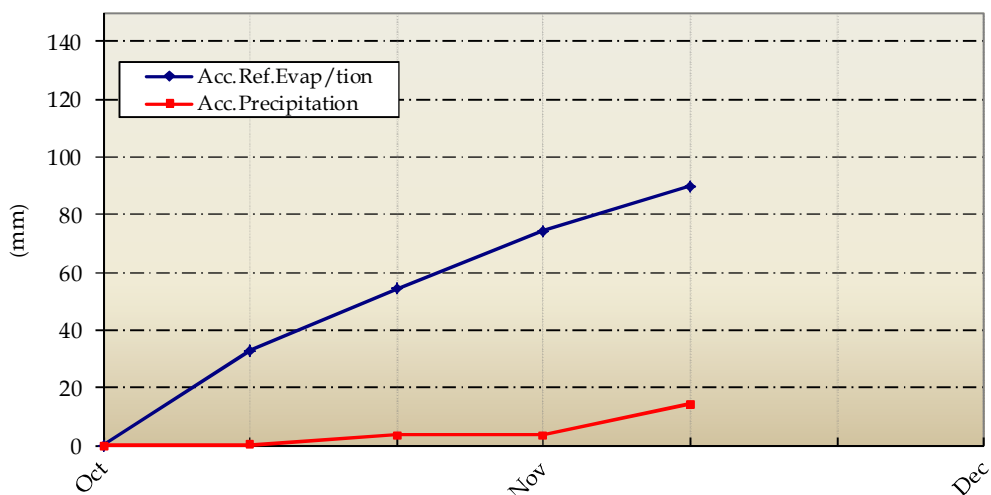
Mikra

1st 10-day period (1-10/11/2022)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	23.9	24.4	25.0	21.6	21.2	19.6	20.7	19.4	18.2	19.1	21.3	18.6	17.8
	Min	9.7	9.6	9.6	10.6	11.0	14.7	11.2	10.6	10.0	11.0	10.8	11.8	9.2
Relative Humidity	Max	85	92	100	100	100	100	100	100	100	100	98	96	88
	Min	39	40	34	65	67	71	59	63	74	62	57	70	54
Soil Temperature at 10 cm	06 UTC	16.2	16.4	16.4	16.8	16.2	17.6	16.4	15.6	15.2	15.6	16.2	15.6	13.3
	12 UTC	17.6	17.8	18.0	18.0	17.8	17.8	17.9	17.0	16.6	15.4	17.4	16.7	15.6
Sunshine Duration		9.2	9.0	8.3	7.2	6.9	0.4	8.2	7.2	5.0	6.8	6.8	2.9	5.0
Precipitation							10.8					10.8	10.0	10.5
Evaporation		-	-	-	-	-	-	-	-	-	-	-	-	23.9
Growing Degrees	5	11.8	12.0	12.3	11.1	11.1	12.2	11.0	10.0	9.1	10.1	110.6	101.8	79.8
	10	6.8	7.0	7.3	6.1	6.1	7.2	6.0	5.0	4.1	5.1	60.6	51.8	34.9

1st 10-day period (1-10/11/2022)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	15.5	10.8	9.2
Precipitation - Reference Evapotranspiration	-4.7	-0.8	1.3
Number of Rainy Days	1.0	2.0	1.7
Number of Dry Days	21.0	14.0	-

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

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration





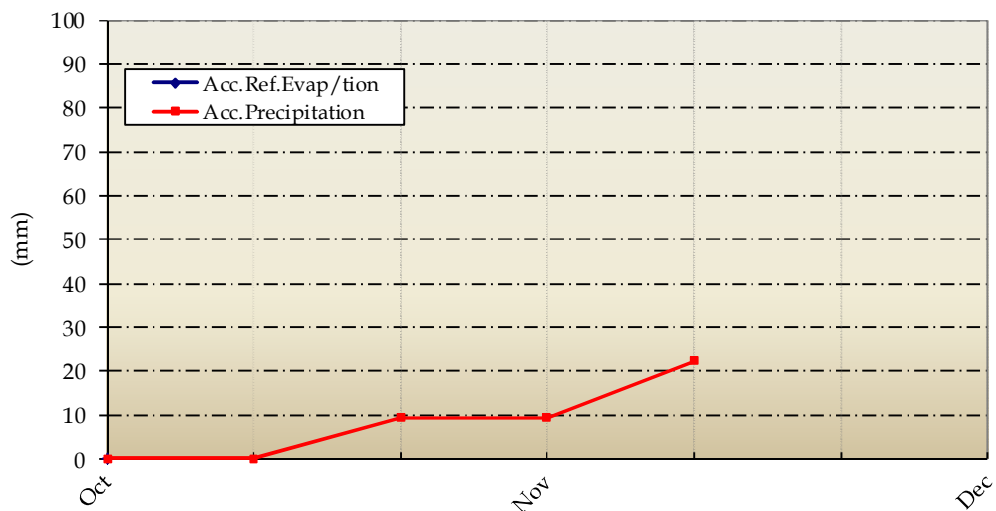
Tanagra

1st 10-day period (1-10/11/2022)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	23.3	26.4	27.2	24.2	24.3	16.8	18.8	19.6	19.8	19.6	22.0	20.8	19.2
	Min	11.8	8.3	9.6	8.0	7.3	13.4	11.8	10.5	8.5	9.4	9.9	10.9	10.0
Relative Humidity	Max	76	79	79	81	98	99	99	98	99	98	91	96	93
	Min	18	26	24	33	36	66	62	51	54	47	42	56	50
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
Sunshine Duration		8.6	8.3	8.2	7.1	8.2	0.0	3.8	7.1	6.4	7.5	6.5	5.1	5.0
Precipitation							10.9	2.1				13.0	0.0	20.3
Evaporation		-	-	-	-	-	-	-	-	-	-	-	-	29.3
Growing Degrees	5	12.6	12.4	13.4	11.1	10.8	10.1	10.3	10.1	9.2	9.5	109.3	108.6	82.8
	10	7.6	7.4	8.4	6.1	5.8	5.1	5.3	5.1	4.2	4.5	59.3	58.6	40.7

1st 10-day period (1-10/11/2022)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	-	-	-
Precipitation - Reference Evapotranspiration	-	-	-
Number of Rainy Days	2.0	0.0	2.1
Number of Dry Days	21.0	10.0	-

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

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



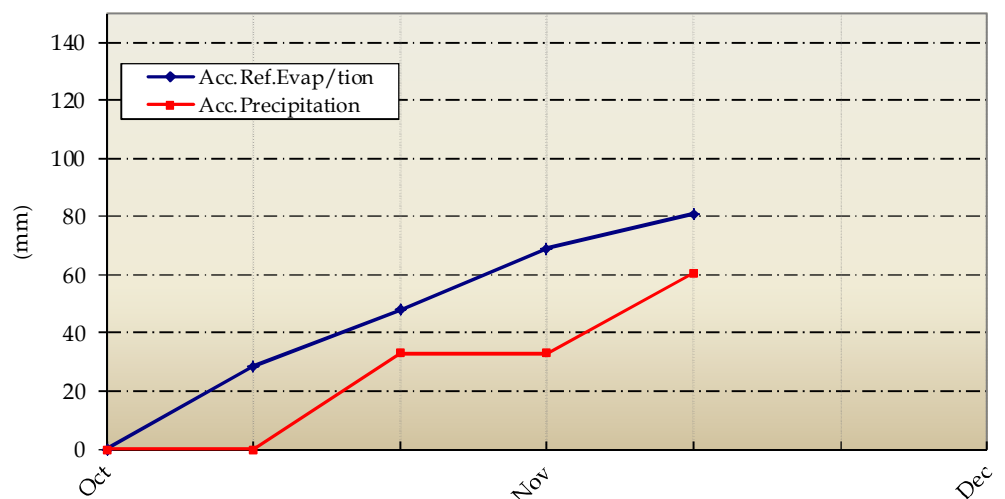
Tripoli

1st 10-day period (1-10/11/2022)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	21.6	24.6	26.2	24.2	20.8	16.1	17.6	19.2	19.6	18.7	20.9	21.0	17.8
	Min	8.6	2.5	3.0	3.6	2.2	9.6	4.7	3.5	1.3	2.2	4.1	7.1	5.1
Relative Humidity	Max	79	90	94	94	99	99	100	100	100	100	96	96	95
	Min	25	18	14	14	34	56	54	35	27	47	32	44	46
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	11.2
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	13.4
Sunshine Duration		8.6	8.9	7.2	8.5	6.6	2.0	4.3	6.5	7.9	7.2	6.8	4.9	6.0
Precipitation						1.8	26.1					27.9	5.0	19.1
Evaporation		-	-	-	-	-	-	-	-	-	-	-	-	27.9
Growing Degrees	5	10.1	8.6	9.6	8.9	6.5	7.9	6.2	6.4	5.5	5.5	74.9	90.8	54.3
	10	5.1	3.6	4.6	3.9	1.5	2.9	1.2	1.4	0.5	0.5	24.9	40.8	17.6

1st 10-day period (1-10/11/2022)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	12.0	14.2	10.0
Precipitation - Reference Evapotranspiration	15.9	-9.2	9.1
Number of Rainy Days	2.0	2.0	1.9
Number of Dry Days	20.0	7.0	-

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<sub>n</sub> 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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