



# AGROMETEOROLOGICAL BULLETIN

*December 2021*  
*3rd 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



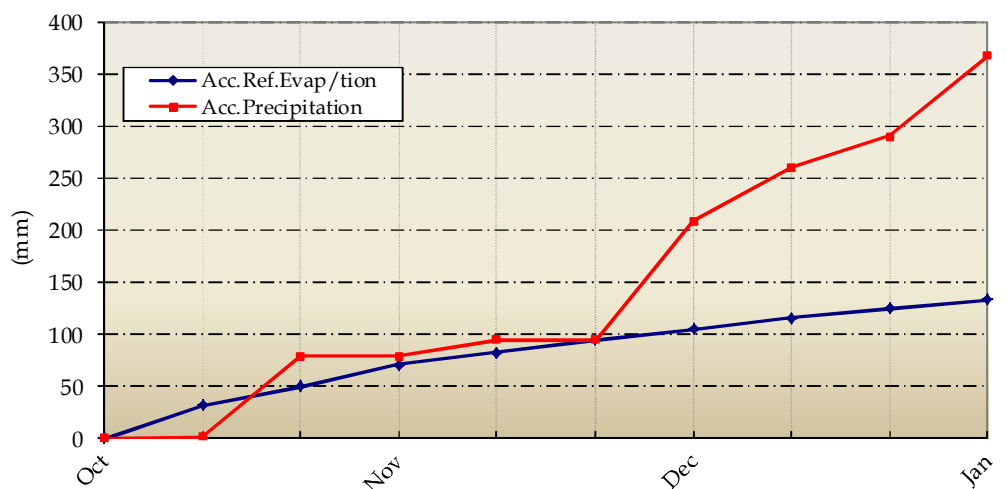
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3rd 10-day period (21-31/12/2021)		21	22	23	24	25	26	27	28	29	30	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	9.6	5.0	5.2	10.2	14.4	14.6	16.0	14.4	12.6	11.4	11.4	11.3	15.1	9.9
	Min	-2.0	0.0	-2.8	-3.0	1.6	2.0	9.2	12.6	10.6	8.4	5.2	3.8	9.8	2.3
Relative Humidity	Max	84	82	72	96	97	97	95	93	97	92	85	90	90	90
	Min	38	37	54	60	60	70	87	88	84	69	62	64	70	61
Soil Temperature at 10 cm	06 UTC	4.8	3.8	2.6	2.5	4.4	5.6	8.4	11.0	11.4	10.3	7.6	6.6	10.5	6.1
	12 UTC	6.6	4.6	3.8	5.4	7.0	8.2	9.0	11.6	11.4	10.0	9.4	7.9	11.4	7.2
Sunshine Duration		6.7	2.4	8.2	8.1	7.4	1.2	1.7	0.2	0.0	0.0	7.0	3.9	2.1	3.5
Precipitation									25.7	34.9	16.6		77.2	30.4	30.2
Evaporation		0.0	0.0	0.0	0.0	1.0	0.5	1.6	0.3	2.9	1.5	1.7	9.5	14.9	15.3
Growing Degrees	5	0.0	0.0	0.0	0.0	3.0	3.3	7.6	8.5	6.6	4.9	3.3	37.2	82.0	24.5
	10	0.0	0.0	0.0	0.0	0.0	0.0	2.6	3.5	1.6	0.0	0.0	7.7	34.5	6.4

3rd 10-day period (21-31/12/2021)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	7.9	10.2	6.3
Precipitation - Reference Evapotranspiration	69.3	20.2	23.9
Number of Rainy Days	3.0	3.0	2.9
Number of Dry Days	9.0	12.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

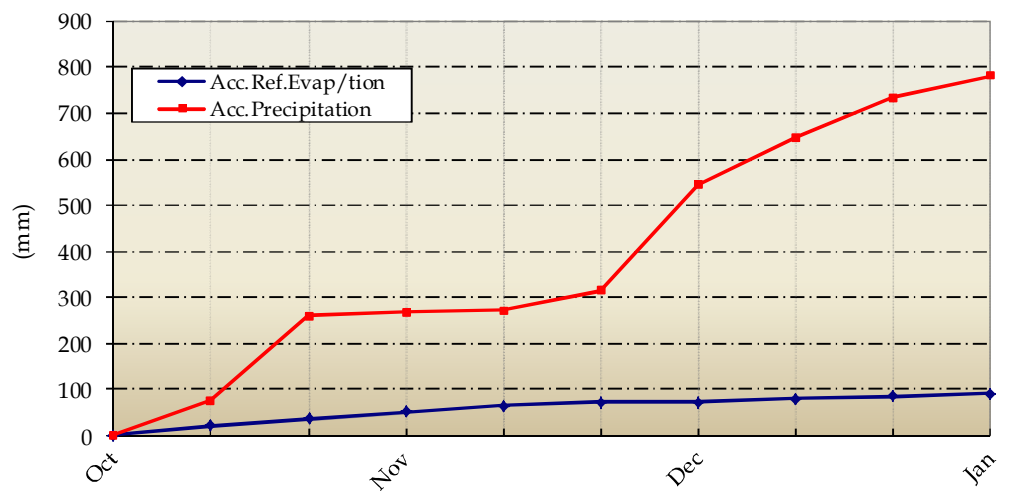


3rd 10-day period (21-31/12/2021)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	14.5	13.2	13.0	15.1	16.2	17.4	18.2	15.6	17.1	15.7	17.9	15.8	17.9	14.6
	Min	4.6	1.6	1.4	0.5	3.1	10.2	13.6	11.0	9.3	6.0	9.0	6.4	10.0	6.4
Relative Humidity	Max	96	92	98	96	96	92	94	98	99	99	85	95	94	91
	Min	47	54	46	57	65	76	77	84	75	51	50	62	58	54
Soil Temperature at 10 cm	06 UTC	9.0	8.5	9.0	8.0	9.8	11.8	12.6	13.2	12.8	12.0	11.0	10.7	12.6	9.9
	12 UTC	10.0	9.2	9.8	9.0	10.0	11.8	13.0	13.4	13.6	12.6	12.0	11.3	13.5	11.4
Sunshine Duration		6.2	1.3	6.1	5.1	3.4	0.3	0.4	0.0	2.0	5.5	6.8	3.4	3.5	4.4
Precipitation						0.9		4.1	33.7	6.5	2.2		47.4	35.1	41.4
Evaporation		2.8	3.0	4.5	3.0	0.4	4.5	0.2	0.2	0.2	0.2	0.3	19.3	-	39.2
Growing Degrees	5	4.6	2.4	2.2	2.8	4.7	8.8	10.9	8.3	8.2	5.9	8.5	67.1	98.7	52.0
	10	0.0	0.0	0.0	0.0	0.0	3.8	5.9	3.3	3.2	0.9	3.5	20.5	43.7	14.6

3rd 10-day period (21-31/12/2021)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	6.3	-	9.8
Precipitation - Reference Evapotranspiration	41.1	-	31.6
Number of Rainy Days	5.0	7.0	4.3
Number of Dry Days	6.0	8.0	-

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

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



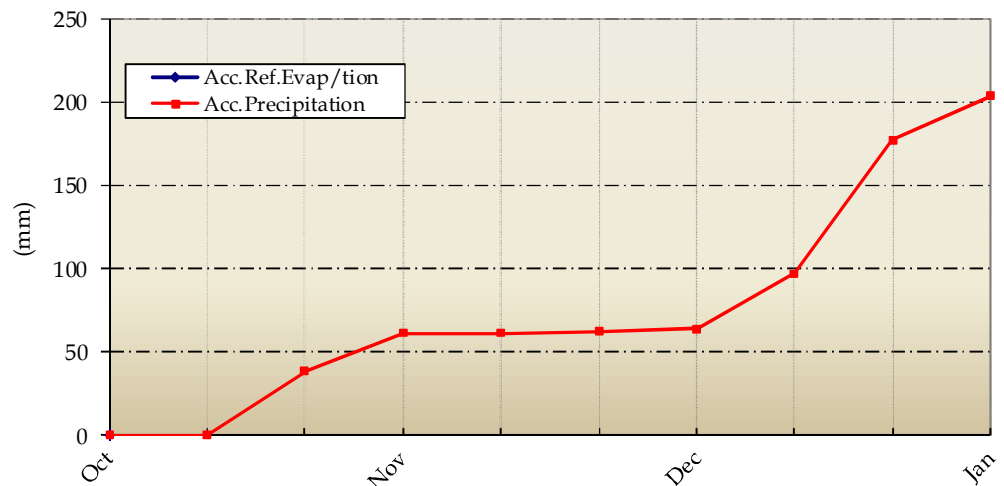
Iraklio

3rd 10-day period (21-31/12/2021)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	17.0	14.8	11.6	14.8	16.4	20.0	19.2	18.8	18.0	14.4	16.6	16.5	18.3	16.4
	Min	9.2	9.2	7.0	6.6	6.8	9.2	12.6	12.2	11.4	12.0	11.8	9.8	12.5	10.5
Relative Humidity	Max	85	94	95	91	92	76	77	88	88	95	95	89	88	85
	Min	60	59	71	64	50	47	48	53	51	74	79	60	62	60
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sunshine Duration		3.9	4.4	0.0	7.5	3.6	7.3	7.0	2.9	5.8	0.5	1.5	4.0	5.7	3.3
Precipitation		0.8		2.8					0.0	1.2	1.4	19.9	26.1	0.4	31.7
Evaporation		0.5	2.0	0.4	1.6	1.5	1.4	3.0	1.3	2.2	0.8	1.0	15.7	22.8	36.5
Growing Degrees	5	8.1	7.0	4.3	5.7	6.6	9.6	10.9	10.5	9.7	8.2	9.2	89.8	114.3	87.7
	10	3.1	2.0	0.0	0.7	1.6	4.6	5.9	5.5	4.7	3.2	4.2	35.5	59.3	37.3

3rd 10-day period (21-31/12/2021)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	-	-	
Precipitation - Reference Evapotranspiration	-	-	
Number of Rainy Days	5.0	2.0	4.7
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



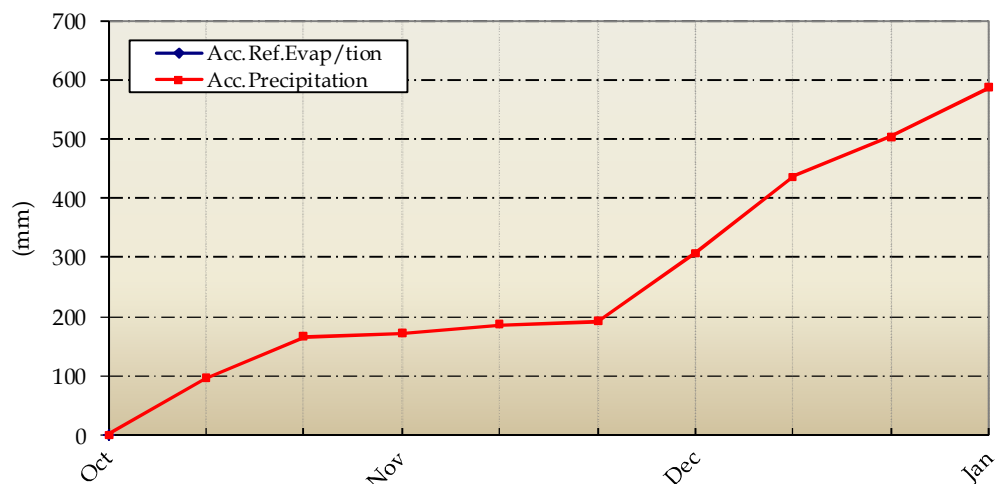
Ioannina

3rd 10-day period (21-31/12/2021)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	9.4	9.1	10.0	6.5	8.1	11.2	10.7	10.9	10.1	13.8	18.1	10.7	12.8	9.0
	Min	-4.0	-7.4	-6.6	-3.7	-0.6	5.8	8.4	7.6	6.1	2.6	3.9	1.1	5.8	0.7
Relative Humidity	Max	100	94	95	100	100	100	100	100	100	100	82	97	98	94
	Min	27	48	33	65	81	83	71	87	86	41	43	60	74	60
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-	4.6
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-	4.7
Sunshine Duration		7.6	4.0	7.1	0.0	0.0	0.0	0.0	0.0	0.1	6.3	7.2	2.9	2.1	2.8
Precipitation						1.3	22.0	41.4	18.3	0.2	0.0		83.2	89.1	55.6
Evaporation		-	-	-	-	-	-	-	-	-	-	-	-	-	
Growing Degrees	5	0.0	0.0	0.0	0.0	0.0	3.5	4.6	4.3	3.1	3.2	6.0	24.6	46.9	12.9
	10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	4.4	1.5

3rd 10-day period (21-31/12/2021)	Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	-	4.2
Precipitation - Reference Evapotranspiration	-	51.4
Number of Rainy Days	5.0	6.0
Number of Dry Days	11.0	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

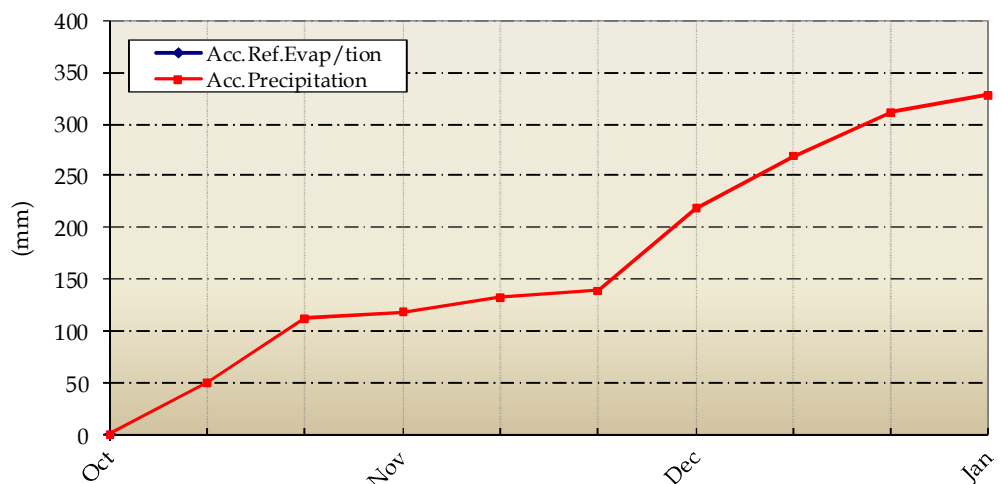


3rd 10-day period (21-31/12/2021)		21	22	23	24	25	26	27	28	29	30	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	16.2	16.5	15.6	15.6	14.9	18.1	18.5	16.8	17.0	15.8	19.1	16.7	18.3	15.4
	Min	3.1	1.1	7.0	1.4	6.9	5.7	15.5	13.1	7.8	9.0	8.1	7.2	8.3	6.1
Relative Humidity	Max	90	92	88	94	98	91	91	98	99	96	-	94	96	90
	Min	35	38	56	46	74	87	71	78	70	49	41	59	58	52
Soil Temperature at 10 cm	06 UTC	9.8	-	10.0	9.2	-	-	12.8	13.4	13.0	12.4	-	11.5	12.1	10.6
	12 UTC	10.2	9.6	10.8	-	-	-	13.6	13.8	13.6	12.2	-	12.0	13.2	11.4
Sunshine Duration		7.4	7.8	2.7	8.4	0.0	6.0	1.9	0.2	2.7	1.9	6.7	4.2	4.4	4.8
Precipitation						0.0	0.1	1.9	14.1	0.0	0.3	0.0	16.4	24.6	41.3
Evaporation		-	-	-	-	-	-	-	-	-	-	-	-	13.0	20.9
Growing Degrees	5	4.7	3.8	6.3	3.5	5.9	6.9	12.0	10.0	7.4	7.4	8.6	76.4	91.2	55.3
	10	0.0	0.0	1.3	0.0	0.9	1.9	7.0	5.0	2.4	2.4	3.6	24.5	36.2	13.7

3rd 10-day period (21-31/12/2021)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	-	-	11.3
Precipitation - Reference Evapotranspiration	-	-	30.0
Number of Rainy Days	4.0	6.0	4.7
Number of Dry Days	7.0	11.0	-

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Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



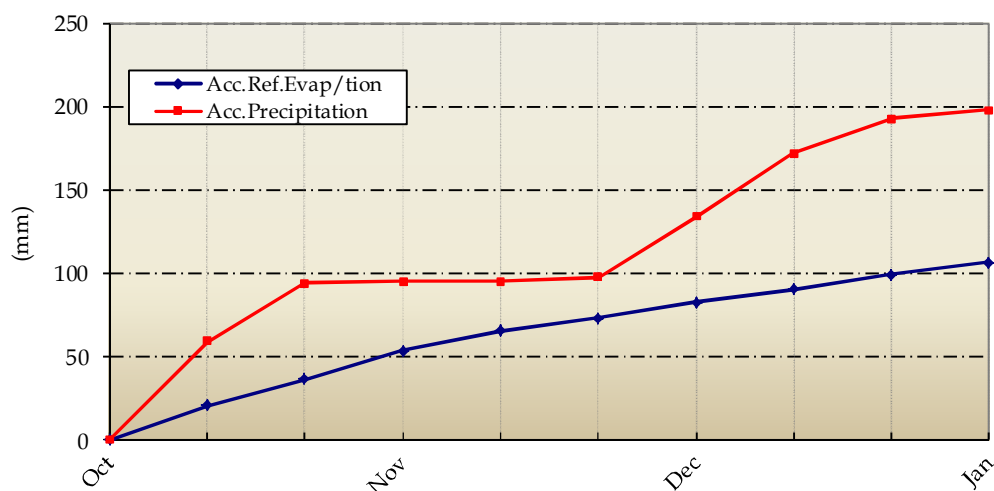
Larisa

3rd 10-day period (21-31/12/2021)		21	22	23	24	25	26	27	28	29	30	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	9.4	7.2	7.8	9.6	14.8	11.2	13.8	11.8	12.8	13.8	16.3	11.7	15.0	10.2
	Min	1.6	-2.4	-5.0	-4.4	-3.4	2.8	5.6	5.8	9.0	6.6	5.6	2.0	4.8	1.1
Relative Humidity	Max	74	91	95	96	96	97	98	100	100	100	96	95	97	95
	Min	35	40	41	48	49	71	74	90	86	48	47	57	64	58
Soil Temperature at 10 cm	06 UTC	6.0	4.4	4.6	4.0	4.0	5.8	7.0	7.4	9.4	9.4	9.0	6.5	-	6.4
	12 UTC	6.4	6.4	4.8	4.4	4.8	6.4	8.0	8.2	10.0	9.4	9.6	7.1	-	7.1
Sunshine Duration		3.8	1.0	7.9	6.4	5.9	0.0	0.1	0.0	1.0	4.1	8.0	3.5		3.5
Precipitation								0.2	2.8	1.4	0.6		5.0	5.3	13.4
Evaporation		0.8	0.0	0.0	0.0	0.0	0.0	0.0	1.6	1.3	3.8	0.5	8.0	10.1	13.4
Growing Degrees	5	0.5	0.0	0.0	0.0	0.7	2.0	4.7	3.8	5.9	5.2	6.0	28.8	54.1	18.1
	10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.2	1.0	2.1	7.4	2.6

3rd 10-day period (21-31/12/2021)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	7.1	-	7.5
Precipitation - Reference Evapotranspiration	-2.1	-	5.9
Number of Rainy Days	4.0	3.0	3.0
Number of Dry Days	8.0	5.0	-

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

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



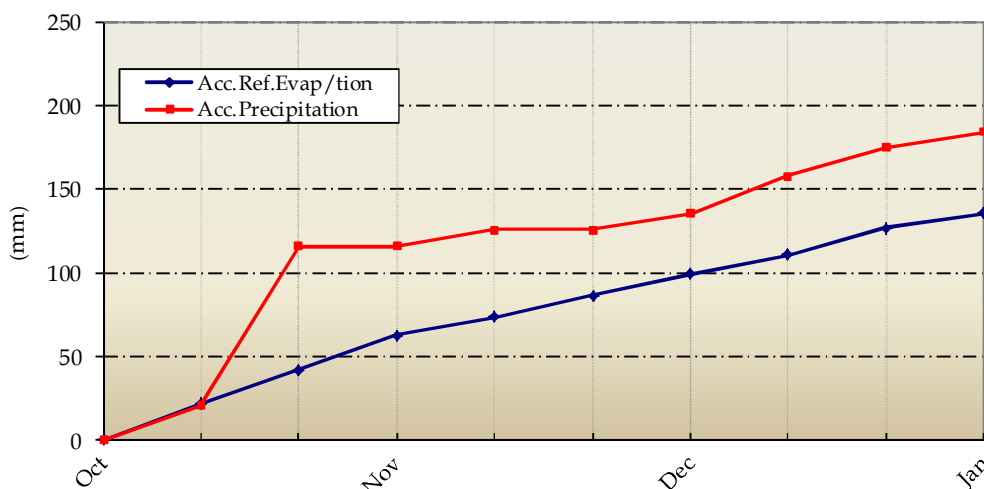
Mikra

3rd 10-day period (21-31/12/2021)		21	22	23	24	25	26	27	28	29	30	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	9.4	6.9	6.8	8.0	9.2	8.2	13.5	13.6	12.0	13.2	14.5	10.5	14.9	10.1
	Min	2.8	-4.0	-4.8	-3.7	-2.0	1.7	7.0	6.5	9.0	9.9	10.0	2.9	8.1	2.6
Relative Humidity	Max	63	79	88	93	92	97	100	100	100	73	89	89	93	87
	Min	37	36	41	59	70	82	75	90	75	54	56	61	64	56
Soil Temperature at 10 cm	06 UTC	6.2	5.2	4.0	4.0	4.4	5.2	7.2	8.4	9.0	9.2	9.2	6.5	10.8	5.8
	12 UTC	6.4	5.4	6.0	4.8	5.0	6.0	8.2	8.7	9.6	9.4	9.6	7.2	11.8	7.5
Sunshine Duration		9.0	8.2	8.3	7.7	6.3	0.0	0.0	0.0	0.0	3.4	7.7	4.6	3.7	4.3
Precipitation							0.8	4.8	0.9	2.8			9.3	1.1	13.2
Evaporation		-	-	-	-	-	-	-	-	-	-	-	-	-	17.5
Growing Degrees	5	1.1	0.0	0.0	0.0	0.0	0.0	5.3	5.1	5.5	6.6	7.3	30.7	71.4	23.1
	10	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.1	0.5	1.6	2.3	4.6	20.1	4.1

3rd 10-day period (21-31/12/2021)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	8.8	10.2	5.3
Precipitation - Reference Evapotranspiration	0.5	-9.1	7.9
Number of Rainy Days	4.0	2.0	2.6
Number of Dry Days	10.0	9.0	-

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

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration





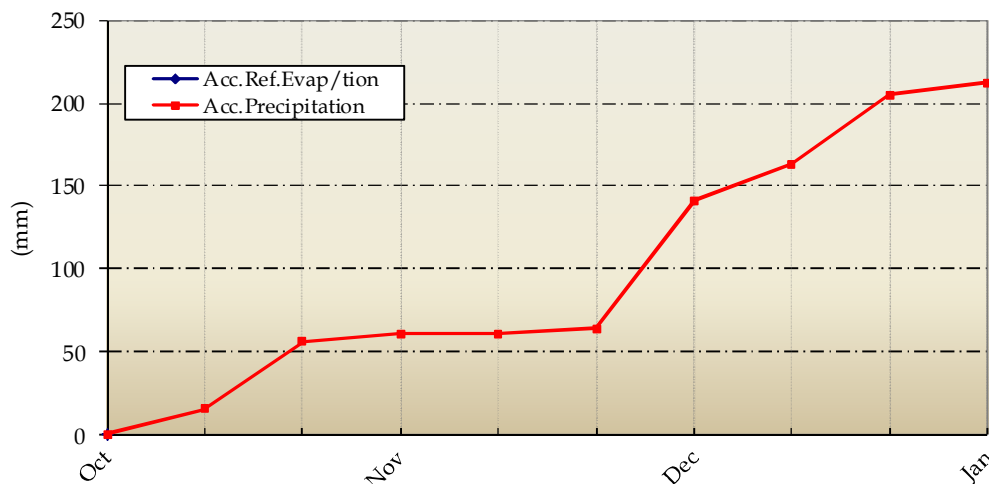
Tanagra

3rd 10-day period (21-31/12/2021)		21	22	23	24	25	26	27	28	29	30	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	7.8	9.3	9.0	13.6	16.2	18.4	17.8	16.6	13.8	10.8	12.9	13.3	16.8	12.4
	Min	0.7	4.0	0.9	-2.6	0.3	4.3	7.7	13.0	11.0	7.0	10.3	5.1	7.8	4.5
Relative Humidity	Max	81	79	100	100	98	92	97	100	100	100	94	95	93	94
	Min	53	46	45	36	47	46	47	67	90	72	67	56	52	54
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sunshine Duration		0.0	2.5	6.7	6.8	8.1	6.6	2.1	0.0	0.0	0.0	0.6	3.0	4.9	3.5
Precipitation									2.3	2.6	1.7	0.6	7.2	17.0	31.8
Evaporation		-	-	-	-	-	-	-	-	-	-	-	-	-	20.7
Growing Degrees	5	0.0	1.7	0.0	0.5	3.3	6.4	7.8	9.8	7.4	3.9	6.6	47.2	80.4	37.0
	10	0.0	0.0	0.0	0.0	0.0	1.4	2.8	4.8	2.4	0.0	1.6	12.9	26.8	8.6

3rd 10-day period (21-31/12/2021)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	-	-	
Precipitation - Reference Evapotranspiration	-	-	
Number of Rainy Days	4.0	2.0	3.6
Number of Dry Days	8.0	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

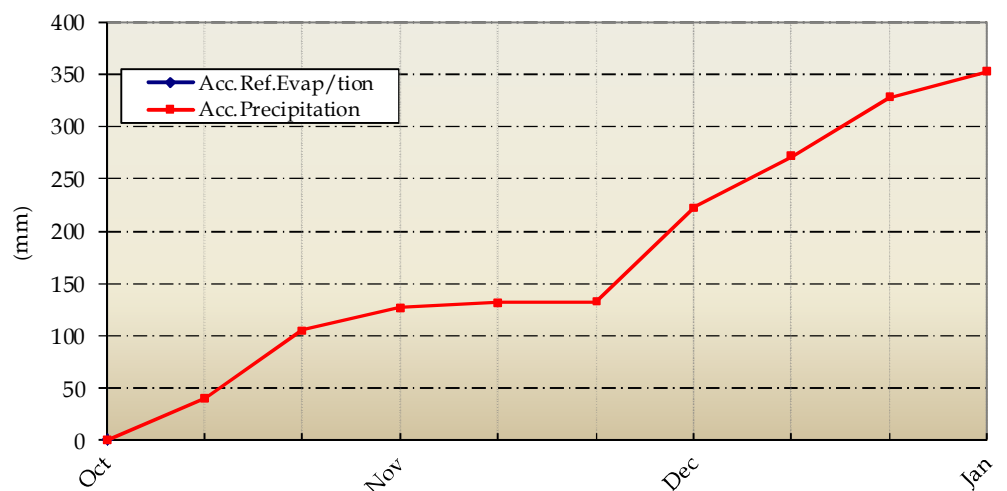


3rd 10-day period (21-31/12/2021)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	11.8	9.8	7.0	10.8	11.5	13.1	12.9	12.2	11.8	9.6	12.9	11.2	13.0	10.0
	Min	-0.3	-1.6	2.9	-3.8	3.0	6.1	7.1	7.7	3.0	1.9	7.4	3.0	4.5	0.8
Relative Humidity	Max	98	95	98	99	95	91	97	100	100	100	100	98	97	96
	Min	26	46	79	45	65	69	67	94	74	62	51	62	63	56
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-	4.9
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-	6.1
Sunshine Duration		6.9	3.9	0.0	5.4	0.4	3.2	0.2	0.0	1.7	2.4	7.0	2.8	3.1	4.0
Precipitation		0.0	0.0		0.0	0.1	0.0	11.3	12.5	0.0	0.4	0.4	24.7	32.9	31.9
Evaporation		-	-	-	-	-	-	-	-	-	-	-	-	-	77.0
Growing Degrees	5	0.8	0.0	0.0	0.0	2.3	4.6	5.0	5.0	2.4	0.8	5.2	25.9	40.9	14.3
	10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	3.0	1.8

3rd 10-day period (21-31/12/2021)	Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	-	6.5
Precipitation - Reference Evapotranspiration	-	25.4
Number of Rainy Days	5.0	6.0
Number of Dry Days	5.0	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





◆ **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.

**Measurements 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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