



AGROMETEOROLOGICAL BULLETIN

*October 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



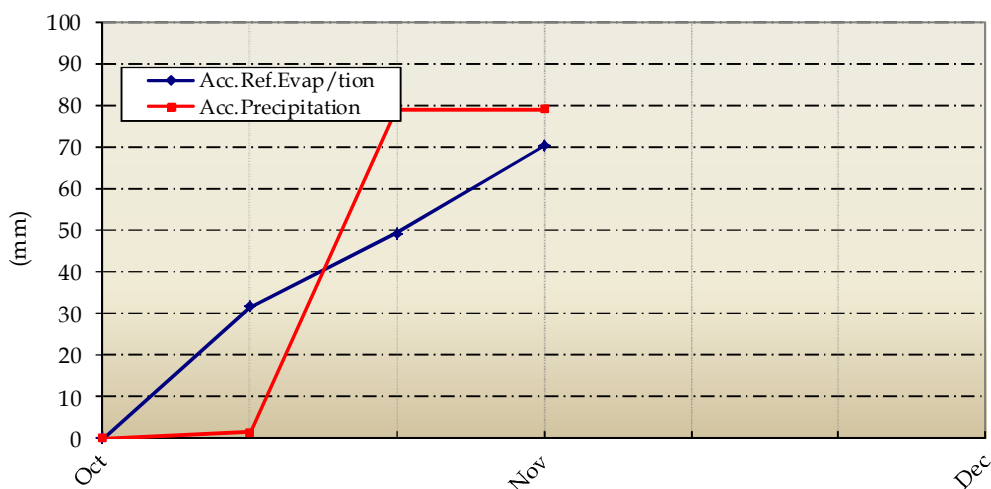
Hellenic National Meteorological Service
Division of Climatology-Applications
El. Venizelou Street 14, 16777
Helliniko, Athens

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

3rd 10-day period (21-31/10/2021)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	18.4	21.4	20.0	14.8	16.4	16.8	17.4	18.0	17.6	18.0	18.0	17.9	21.5	18.7
	Min	5.0	13.4	9.8	11.0	8.4	8.6	9.4	8.0	8.4	11.0	9.6	9.3	11.2	9.4
Relative Humidity	Max	97	91	95	88	82	78	82	84	78	82	70	84	91	89
	Min	62	60	70	57	37	46	41	42	45	56	31	50	56	54
Soil Temperature at 10 cm	06 UTC	13.2	15.4	15.4	15.6	12.4	11.8	12.4	12.6	12.6	13.4	13.4	13.5	16.5	13.1
	12 UTC	16.6	18.0	18.0	15.0	15.4	14.8	15.4	15.8	15.6	15.6	16.2	16.0	18.9	16.2
Sunshine Duration		8.5	7.0	8.4	0.0	9.5	7.0	9.3	9.0	8.2	8.0	8.9	7.6	6.1	4.2
Precipitation					0.0							0.0	0.0	16.4	15.9
Evaporation		0.7	2.6	3.1	1.5	3.6	3.4	4.3	3.2	2.3	3.3	5.3	33.3	29.1	35.8
Growing Degrees	5	6.7	12.4	9.9	7.9	7.4	7.7	8.4	8.0	8.0	9.5	8.8	94.7	125.0	89.0
	10	1.7	7.4	4.9	2.9	2.4	2.7	3.4	3.0	3.0	4.5	3.8	39.7	70.0	41.8

3rd 10-day period (21-31/10/2021)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	20.9	16.6	15.2
Precipitation - Reference Evapotranspiration	-20.9	-0.2	0.7
Number of Rainy Days	0.0	2.0	1.7
Number of Dry Days	14.0	14.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

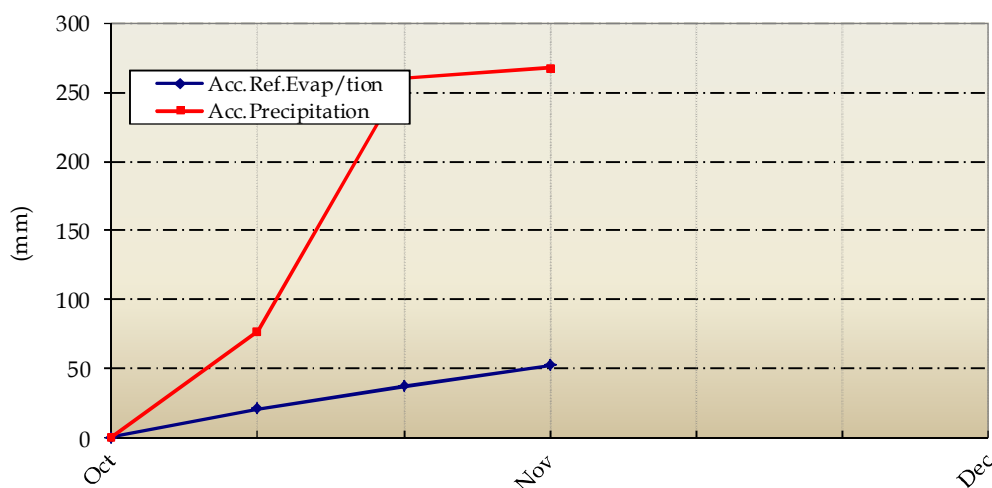


3rd 10-day period (21-31/10/2021)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	23.1	23.3	24.4	22.8	19.2	21.7	21.8	22.6	21.3	21.4	21.7	22.1	23.1	22.5
	Min	12.1	14.1	15.1	13.5	14.1	13.0	10.8	6.7	8.2	9.5	8.0	11.4	11.4	12.2
Relative Humidity	Max	93	95	98	98	98	93	94	96	96	93	96	95	95	92
	Min	41	64	58	71	62	48	43	36	43	46	34	50	49	50
Soil Temperature at 10 cm	06 UTC	17.4	18.6	19.0	18.8	19.4	19.0	17.2	16.4	15.4	16.4	16.0	17.6	18.3	17.2
	12 UTC	20.0	21.6	22.0	19.8	20.6	20.8	21.4	18.0	18.8	20.6	21.0	20.4	20.0	20.2
Sunshine Duration		8.6	6.3	6.1	6.1	0.0	4.7	9.5	9.4	1.6	3.1	9.8	5.9	7.3	4.7
Precipitation					0.6	6.7							7.3	2.9	18.7
Evaporation		1.7	2.0	1.9	0.8	0.4	0.4	0.5	0.8	1.1	0.6	5.5	15.7	30.2	48.5
Growing Degrees	5	12.6	13.7	14.8	13.2	11.7	12.4	11.3	9.7	9.8	10.5	9.9	129.2	135.0	111.5
	10	7.6	8.7	9.8	8.2	6.7	7.4	6.3	4.7	4.8	5.5	4.9	74.2	80.0	65.8

3rd 10-day period (21-31/10/2021)	Previous Year Value	Past Years Mean Value	
Reference Evapotranspiration	15.2	-	17.7
Precipitation - Reference Evapotranspiration	-7.9	-	1.0
Number of Rainy Days	2.0	1.0	2.1
Number of Dry Days	6.0	13.0	-

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

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

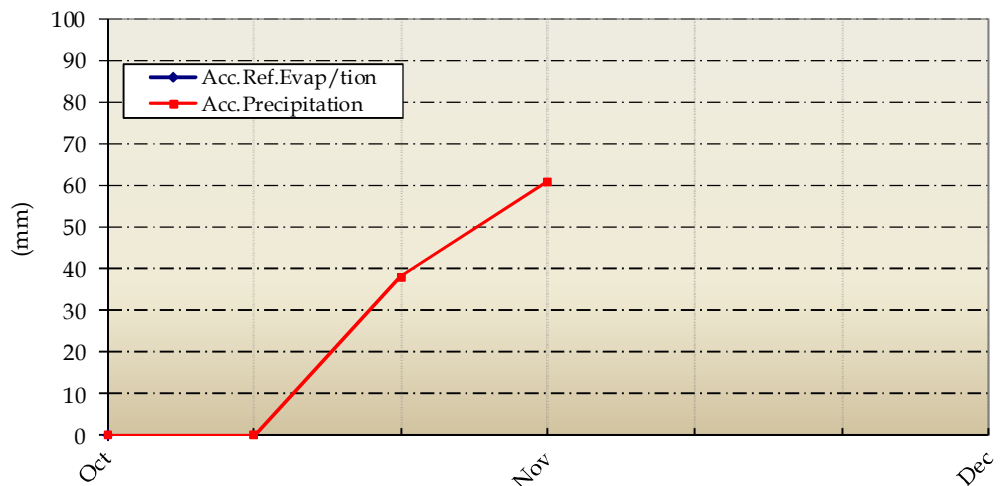


3rd 10-day period (21-31/10/2021)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	21.4	23.4	23.4	24.0	20.4	18.8	18.6	20.2	19.8	19.2	19.0	20.7	22.4	22.7
	Min	14.4	13.6	15.0	15.6	19.0	17.4	14.8	16.2	15.6	16.8	14.0	15.7	16.2	16.2
Relative Humidity	Max	85	85	94	92	83	96	93	88	91	89	83	89	91	86
	Min	62	56	66	52	62	65	73	67	72	70	69	65	67	61
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sunshine Duration		8.3	8.4	9.7	9.5	5.7	0.0	0.0	1.5	0.7	0.0	8.6	4.8	6.3	4.1
Precipitation						0.2	14.7	4.0	0.0			4.0	22.9	205.7	36.2
Evaporation		2.7	3.8	0.4	2.8	3.7	0.1	0.3	1.6	1.0	1.4	8.2	26.0	-	44.0
Growing Degrees	5	12.9	13.5	14.2	14.8	14.7	13.1	11.7	13.2	12.7	13.0	11.5	145.3	157.3	152.3
	10	7.9	8.5	9.2	9.8	9.7	8.1	6.7	8.2	7.7	8.0	6.5	90.3	102.3	99.3

3rd 10-day period (21-31/10/2021)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	-	-	
Precipitation - Reference Evapotranspiration	-	-	
Number of Rainy Days	4.0	6.0	2.6
Number of Dry Days	9.0	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

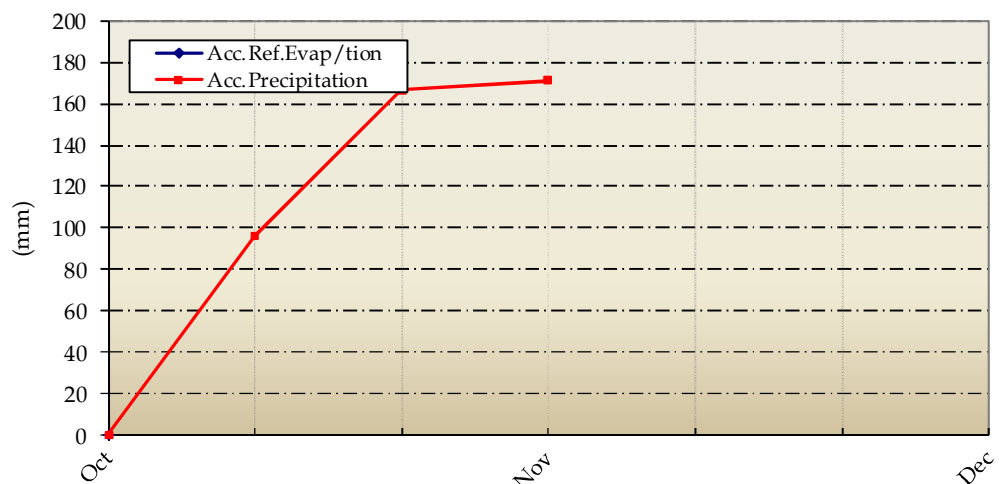


3rd 10-day period (21-31/10/2021)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	18.2	20.9	18.2	15.7	16.0	19.1	19.7	20.6	20.2	17.7	18.0	18.6	20.8	19.0
	Min	6.4	6.2	11.4	12.4	13.6	2.6	0.6	3.3	1.5	2.4	1.4	5.6	4.2	7.5
Relative Humidity	Max	100	100	100	99	92	95	99	78	85	85	98	94	100	97
	Min	52	55	78	94	42	39	35	24	27	34	48	48	44	55
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-	12.4
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-	13.5
Sunshine Duration		4.4	6.0	1.4	0.0	9.3	8.9	9.1	9.5	9.4	9.0	2.4	6.3	6.1	3.1
Precipitation			0.0	3.6	1.1								4.7	0.0	32.9
Evaporation		-	-	-	-	-	-	-	-	-	-	-	-	-	
Growing Degrees	5	7.3	8.6	9.8	9.1	9.8	5.9	5.2	7.0	5.9	5.1	4.7	78.1	82.7	72.4
	10	2.3	3.6	4.8	4.1	4.8	0.9	0.2	2.0	0.9	0.1	0.0	23.4	27.7	29.2

3rd 10-day period (21-31/10/2021)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	-	-	6.1
Precipitation - Reference Evapotranspiration	-	-	26.8
Number of Rainy Days	2.0	0.0	3.0
Number of Dry Days	4.0	15.0	-

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

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

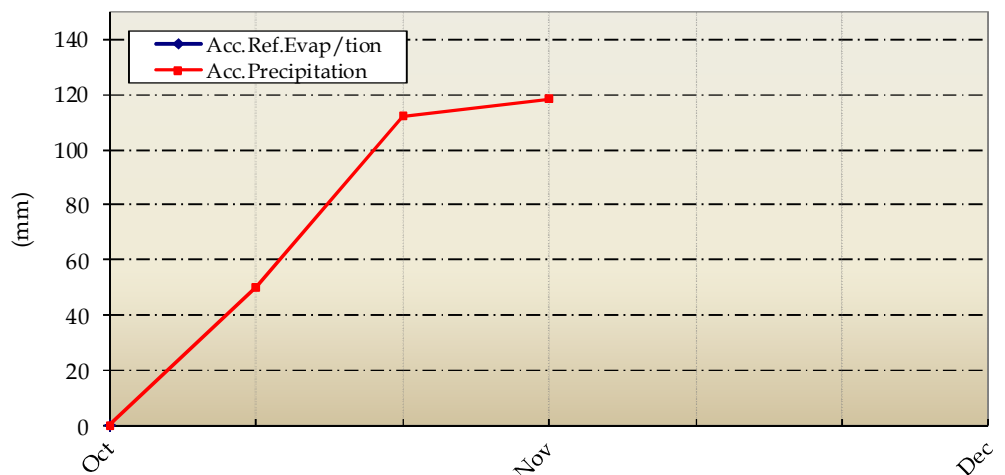


3rd 10-day period (21-31/10/2021)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	23.9	25.9	26.6	24.0	20.9	22.7	21.9	22.7	21.7	23.0	21.7	23.2	24.0	23.5
	Min	10.6	14.3	13.0	15.1	16.2	12.5	11.6	11.8	13.9	15.2	11.7	13.3	11.3	12.3
Relative Humidity	Max	96	96	95	94	96	80	74	64	65	62	82	82	92	91
	Min	35	43	40	64	50	47	52	38	49	43	41	46	43	49
Soil Temperature at 10 cm	06 UTC	17.4	18.0	16.6	16.8	17.8	15.8	14.8	14.2	14.8	15.0	14.8	16.0	17.5	17.8
	12 UTC	23.2	23.2	20.2	23.4	20.0	20.6	20.0	20.8	17.4	20.4	19.6	20.8	19.9	19.4
Sunshine Duration		9.0	9.2	7.9	2.2	2.8	4.2	8.4	9.1	0.5	4.4	6.1	5.8	7.9	5.5
Precipitation					1.1	4.0	1.1						6.2	39.1	27.5
Evaporation		-	-	-	-	-	-	-	-	-	-	-	-	41.5	45.1
Growing Degrees	5	12.3	15.1	14.8	14.6	13.6	12.6	11.8	12.3	12.8	14.1	11.7	145.5	139.3	131.3
	10	7.3	10.1	9.8	9.6	8.6	7.6	6.8	7.3	7.8	9.1	6.7	90.5	84.3	80.0

3rd 10-day period (21-31/10/2021)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	-	-	14.6
Precipitation - Reference Evapotranspiration	-	-	12.9
Number of Rainy Days	3.0	3.0	2.8
Number of Dry Days	3.0	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



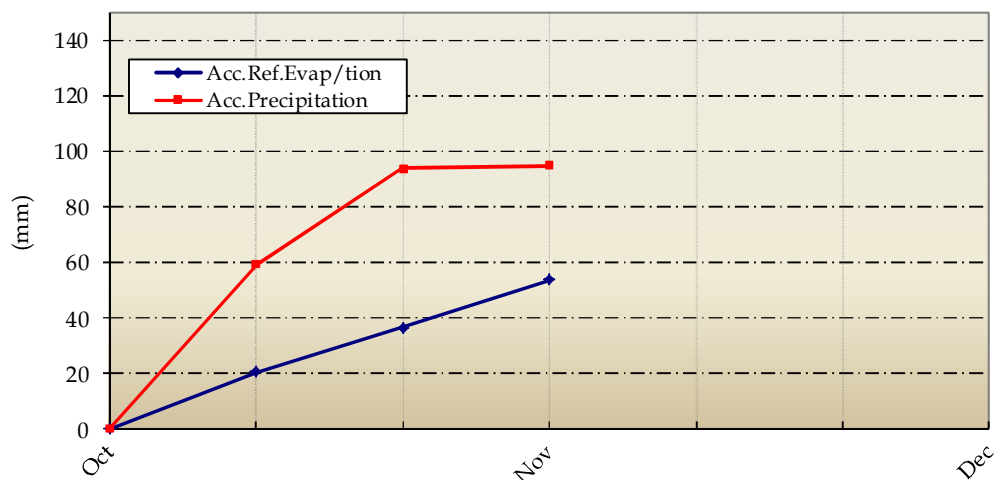
Larisa

3rd 10-day period (21-31/10/2021)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	22.4	24.4	24.4	20.0	15.4	16.4	16.0	17.0	16.8	15.1	17.2	18.6	22.4	20.4
	Min	7.4	7.8	8.4	11.6	9.0	7.0	8.4	4.6	5.6	8.2	10.2	8.0	7.6	9.2
Relative Humidity	Max	99	99	99	99	88	91	91	94	95	86	94	94	92	94
	Min	45	39	46	47	47	40	49	52	48	61	57	48	42	50
Soil Temperature at 10 cm	06 UTC	14.8	15.0	15.0	16.6	15.8	13.6	14.2	11.8	12.8	13.6	14.0	14.3	-	15.8
	12 UTC	18.2	17.8	18.8	18.0	16.0	16.2	15.4	15.6	15.0	13.0	15.2	16.3	-	16.5
Sunshine Duration		8.8	9.3	7.5	2.4	2.3	7.8	3.6	6.7	5.2	0.7	0.3	5.0		3.1
Precipitation					0.3	0.6						0.0	0.9	24.4	17.6
Evaporation		4.2	1.6	2.8	0.2	8.5	2.6	3.0	2.5	1.8	1.0	0.0	28.2	34.8	37.2
Growing Degrees	5	9.9	11.1	11.4	10.8	7.2	6.7	7.2	5.8	6.2	6.7	8.7	91.7	110.5	99.3
	10	4.9	6.1	6.4	5.8	2.2	1.7	2.2	0.8	1.2	1.7	3.7	36.7	55.5	48.9

3rd 10-day period (21-31/10/2021)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	17.2	-	15.6
Precipitation - Reference Evapotranspiration	-16.3	-	2.0
Number of Rainy Days	2.0	1.0	2.5
Number of Dry Days	7.0	14.0	-

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

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



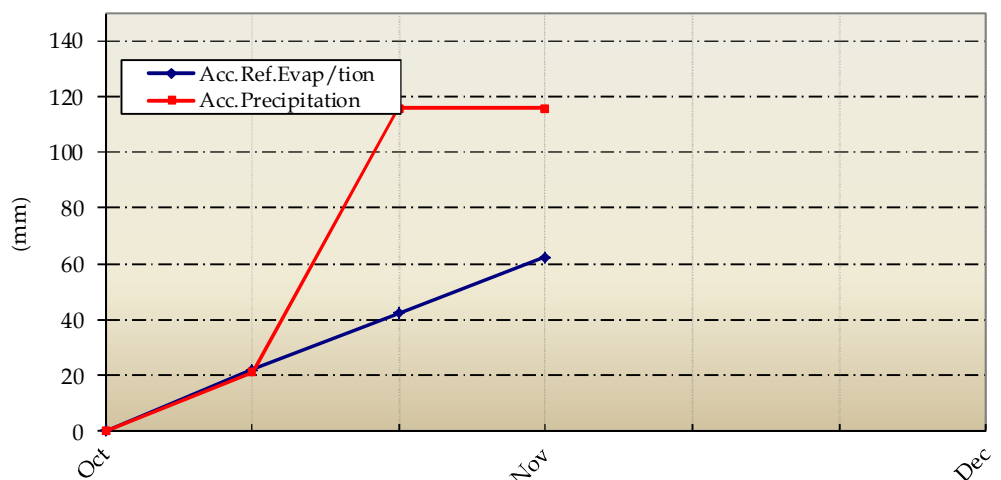
Mikra

3rd 10-day period (21-31/10/2021)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	20.0	20.0	20.8	18.0	17.0	16.1	17.5	17.3	18.0	17.9	17.8	18.2	22.1	19.4
	Min	10.7	9.6	11.8	13.2	10.0	6.2	5.9	6.4	6.2	6.7	7.6	8.6	9.9	10.9
Relative Humidity	Max	93	97	94	95	80	86	93	89	90	89	84	90	87	86
	Min	58	66	68	51	37	44	44	53	50	48	55	52	44	53
Soil Temperature at 10 cm	06 UTC	15.8	15.4	16.2	16.8	15.8	13.8	13.8	13.6	13.2	13.2	13.0	14.6	17.4	15.2
	12 UTC	17.0	17.0	17.8	16.4	16.0	14.4	14.8	15.0	15.6	14.4	15.0	15.8	19.1	17.6
Sunshine Duration		6.2	7.3	6.5	0.4	7.4	9.0	9.5	7.8	8.4	7.6	0.0	6.4	7.6	3.8
Precipitation														0.1	16.9
Evaporation		-	-	-	-	-	-	-	-	-	-	-	-	-	39.5
Growing Degrees	5	10.4	9.8	11.3	10.6	8.5	6.2	6.7	6.9	7.1	7.3	7.7	92.4	121.4	107.1
	10	5.4	4.8	6.3	5.6	3.5	1.2	1.7	1.9	2.1	2.3	2.7	37.4	66.4	55.3

3rd 10-day period (21-31/10/2021)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	20.3	23.8	14.1
Precipitation - Reference Evapotranspiration	-20.3	-23.7	2.8
Number of Rainy Days	0.0	1.0	2.4
Number of Dry Days	13.0	12.0	-

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

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



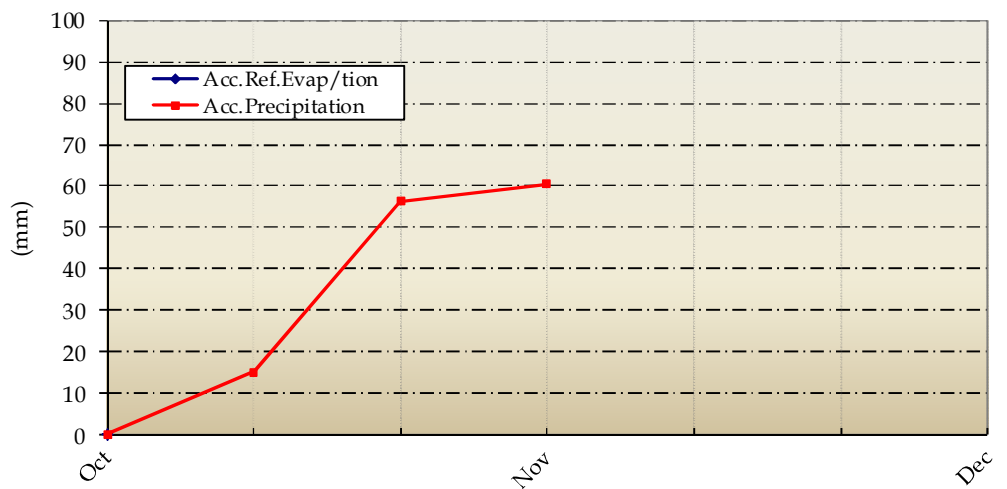
Tanagra

3rd 10-day period (21-31/10/2021)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	22.6	23.2	25.4	20.1	16.0	16.5	17.4	17.1	17.4	17.5	15.8	19.0	22.2	20.8
	Min	8.1	9.3	10.2	12.3	12.2	7.6	8.8	11.0	9.7	12.8	12.1	10.4	10.9	11.2
Relative Humidity	Max	98	99	99	100	93	79	69	78	75	84	69	86	91	92
	Min	33	45	38	61	44	53	43	49	46	53	35	45	42	50
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sunshine Duration		8.8	6.8	8.9	2.4	5.5	7.6	7.5	6.0	6.3	3.6	9.5	6.6	6.3	4.8
Precipitation						3.4						0.9	4.3	13.3	18.5
Evaporation		-	-	-	-	-	-	-	-	-	-	-	-	-	34.8
Growing Degrees	5	10.4	11.3	12.8	11.2	9.1	7.1	8.1	9.1	8.6	10.2	9.0	106.6	127.1	97.1
	10	5.4	6.3	7.8	6.2	4.1	2.1	3.1	4.1	3.6	5.2	4.0	51.6	72.1	52.7

3rd 10-day period (21-31/10/2021)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	-	-	
Precipitation - Reference Evapotranspiration	-	-	
Number of Rainy Days	2.0	3.0	2.0
Number of Dry Days	8.0	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

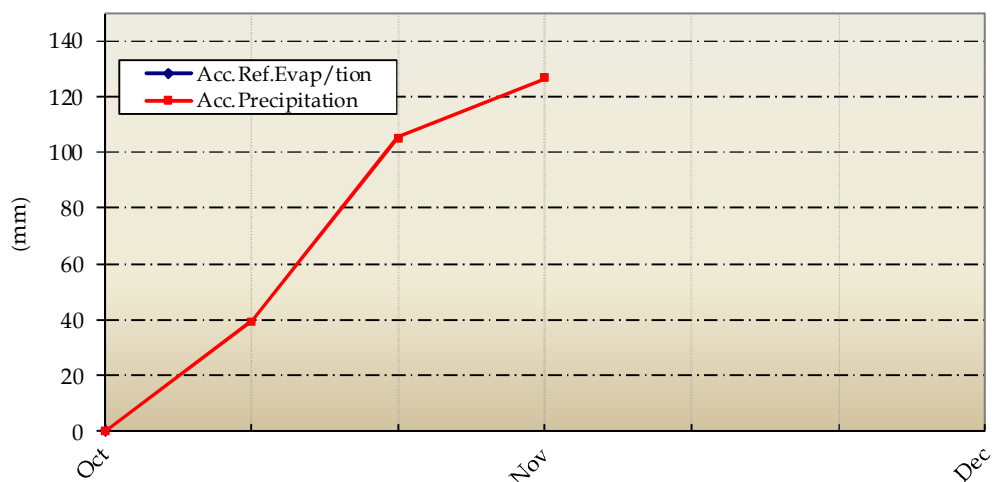


3rd 10-day period (21-31/10/2021)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	19.4	21.4	22.4	21.4	11.1	14.8	15.0	15.3	15.9	14.0	16.5	17.0	20.6	19.3
	Min	4.9	7.9	6.3	7.8	9.6	8.0	6.8	7.7	7.5	10.1	2.5	7.2	4.6	6.5
Relative Humidity	Max	99	99	99	99	95	78	84	81	81	78	94	90	97	95
	Min	37	41	46	53	68	48	50	46	45	62	40	49	39	48
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-	11.2
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-	15.4
Sunshine Duration		8.8	8.9	8.5	2.9	0.0	7.2	9.2	8.0	5.5	0.6	7.4	6.1	6.7	4.1
Precipitation					1.1	20.5					0.0	0.0	21.6	10.7	20.3
Evaporation		-	-	-	-	-	-	-	-	-	-	-	-	-	23.3
Growing Degrees	5	7.2	9.7	9.4	9.6	5.4	6.4	5.9	6.5	6.7	7.1	4.5	78.2	83.7	69.5
	10	2.2	4.7	4.4	4.6	0.4	1.4	0.9	1.5	1.7	2.1	0.0	23.7	29.3	28.1

3rd 10-day period (21-31/10/2021)	Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	-	11.1
Precipitation - Reference Evapotranspiration	-	9.2
Number of Rainy Days	2.0	2.4
Number of Dry Days	5.0	-

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_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.

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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