



AGROMETEOROLOGICAL BULLETIN

October 2019
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



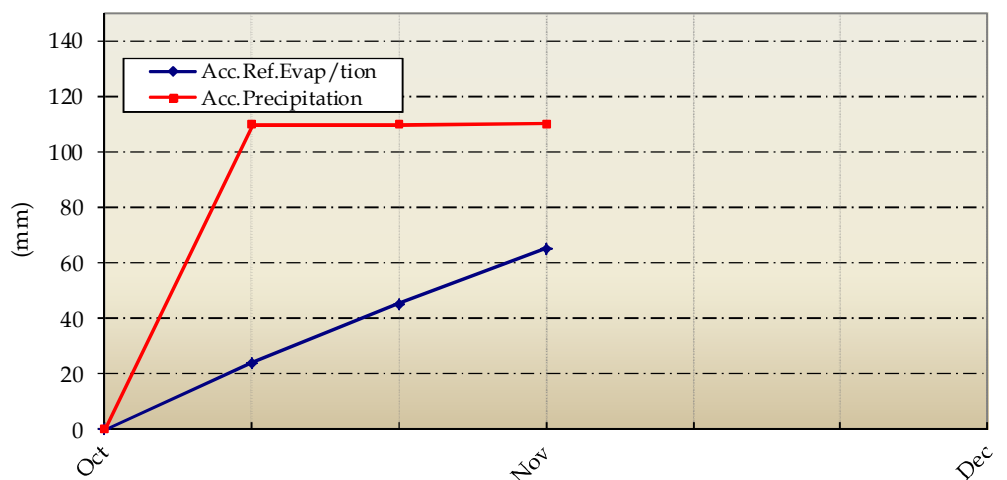
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www.hnms.gr
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3rd 10-day period (21-31/10/2019)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	24.2	23.4	25.0	23.8	23.6	23.2	21.4	20.6	21.4	20.4	17.4	22.2	19.9	17.4
	Min	12.0	11.8	11.0	10.0	10.4	10.2	7.6	6.0	6.6	7.2	12.6	9.6	9.9	8.0
Relative Humidity	Max	93	95	91	90	93	95	93	97	94	95	95	94	88	-
	Min	51	52	31	41	35	50	51	55	49	56	72	49	56	-
Soil Temperature at 10 cm	06 UTC	17.4	16.8	16.6	16.4	16.2	15.6	15.6	14.8	14.4	14.2	16.2	15.8	15.7	12.7
	12 UTC	20.2	20.8	19.6	20.4	19.4	20.2	19.4	18.8	18.6	17.6	17.0	19.3	17.7	15.2
Sunshine Duration		8.9	8.5	9.2	8.3	7.9	8.8	8.4	6.4	8.3	7.2	0.0	7.4	5.9	5.2
Precipitation												0.2	0.2	0.1	22.3
Evaporation		0.8	5.0	4.8	1.2	4.6	2.2	2.6	2.6	1.8	1.9	2.5	30.0	31.6	41.1
Growing Degrees	5	13.1	12.6	13.0	11.9	12.0	11.7	9.5	8.3	9.0	8.8	10.0	119.9	109.0	85.3
	10	8.1	7.6	8.0	6.9	7.0	6.7	4.5	3.3	4.0	3.8	5.0	64.9	54.4	34.4

3rd 10-day period (21-31/10/2019)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	19.9	17.2	20.4
Precipitation - Reference Evapotranspiration	-19.7	-17.1	1.9
Number of Rainy Days	1.0	1.0	2.2
Number of Dry Days	22.0	2.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

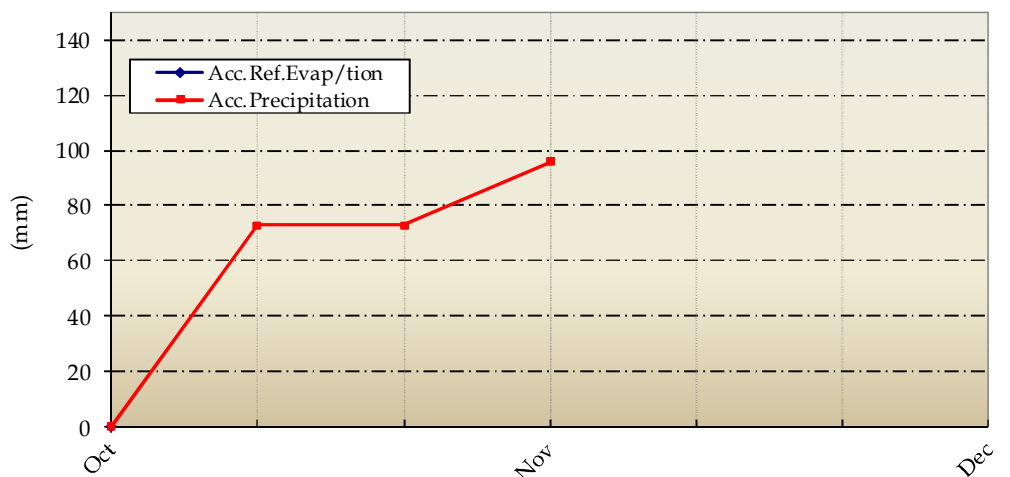


3rd 10-day period (21-31/10/2019)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	25.6	28.3	28.4	27.6	25.1	26.6	25.3	24.4	24.0	25.3	19.1	25.4	24.2	21.5
	Min	12.8	12.0	10.0	7.7	9.7	9.0	8.8	8.0	10.3	12.6	15.1	10.5	13.3	11.4
Relative Humidity	Max	100	100	83	82	88	93	95	95	100	100	100	94	93	-
	Min	58	25	20	24	35	34	28	51	45	54	90	42	44	-
Soil Temperature at 10 cm	06 UTC	20.0	20.0	19.2	19.0	18.5	18.2	17.2	18.0	18.2	19.0	19.6	18.8	18.7	16.1
	12 UTC	21.8	22.4	22.6	20.6	21.6	20.8	19.8	21.0	20.8	20.6	23.0	21.4	20.0	18.7
Sunshine Duration		9.5	8.5	9.3	9.2	8.7	8.9	9.0	8.6	7.8	6.8	0.0	7.8	6.7	6.3
Precipitation											0.3	22.9	23.2	23.1	50.1
Evaporation		2.0	1.0	3.6	2.5	0.8	1.0	4.8	1.4	2.0	7.6	4.0	30.7	33.3	31.6
Growing Degrees	5	14.2	15.2	14.2	12.7	12.4	12.8	12.1	11.2	12.2	14.0	12.1	142.9	151.4	126.2
	10	9.2	10.2	9.2	7.7	7.4	7.8	7.1	6.2	7.2	9.0	7.1	87.9	96.4	71.3

3rd 10-day period (21-31/10/2019)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	-	22.1	18.7
Precipitation - Reference Evapotranspiration	-	1.0	31.4
Number of Rainy Days	2.0	2.0	3.7
Number of Dry Days	19.0	13.0	-

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

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

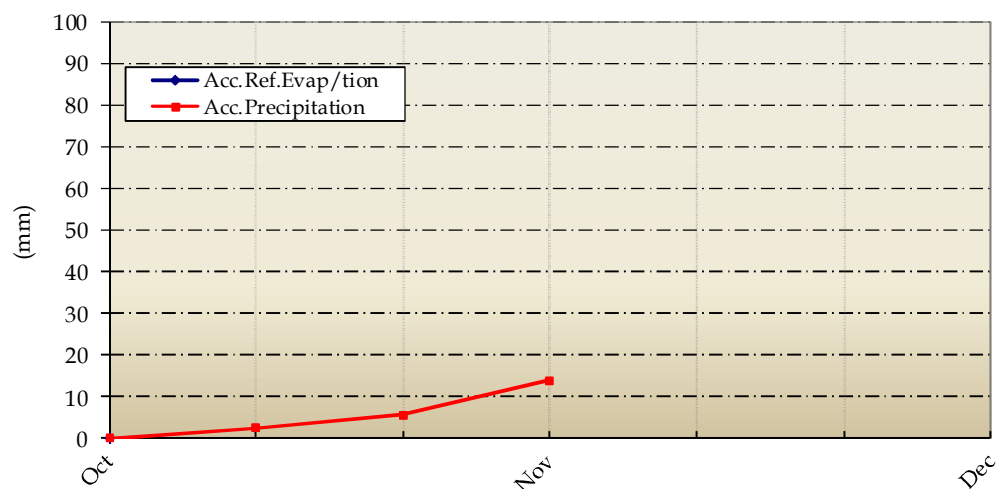


3rd 10-day period (21-31/10/2019)		21	22	23	24	25	26	27	28	29	30	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	24.4	23.6	22.8	23.4	23.8	23.6	22.4	23.0	23.0	23.8	24.4	23.5	22.7	21.6
	Min	17.2	18.0	18.6	20.0	17.4	16.0	20.0	17.4	14.6	14.0	17.2	17.3	15.7	15.6
Relative Humidity	Max	91	91	84	82	93	93	80	86	93	93	91	89	92	-
	Min	66	62	69	63	65	64	63	53	55	64	65	63	67	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sunshine Duration		8.3	6.7	4.5	6.6	8.9	8.6	6.9	8.0	8.6	8.9	8.2	7.7	6.0	5.7
Precipitation												8.3	8.3	2.5	29.2
Evaporation		3.2	1.6	4.4	4.3	3.9	1.1	4.7	3.7	1.7	0.6	0.8	30.0	30.5	48.8
Growing Degrees	5	15.8	15.8	15.7	16.7	15.6	14.8	16.2	15.2	13.8	13.9	15.8	169.3	156.4	149.6
	10	10.8	10.8	10.7	11.7	10.6	9.8	11.2	10.2	8.8	8.9	10.8	114.3	101.4	94.6

3rd 10-day period (21-31/10/2019)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	-	22.6	-
Precipitation - Reference Evapotranspiration	-	-20.1	29.2
Number of Rainy Days	1.0	1.0	3.0
Number of Dry Days	11.0	24.0	-

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Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

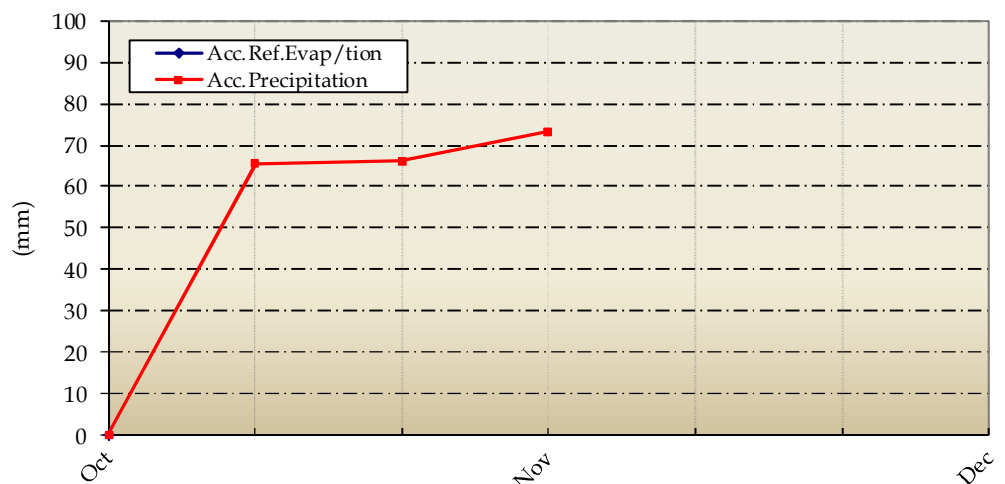


3rd 10-day period (21-31/10/2019)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	25.0	27.1	26.2	25.4	24.5	26.4	24.9	24.2	23.4	19.4	19.0	24.1	20.3	17.6
	Min	5.2	4.8	9.2	2.0	3.8	3.0	1.4	0.4	0.4	2.0	9.7	3.8	9.9	7.0
Relative Humidity	Max	100	100	100	87	100	99	99	91	100	100	100	98	96	-
	Min	41	36	25	29	36	26	20	27	42	58	68	37	44	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-	11.9
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-	13.8
Sunshine Duration		5.8	6.1	7.4	7.6	7.5	-	-	7.0	6.9	1.4	4.2	6.0	3.9	4.6
Precipitation											2.3	4.9	7.2	20.9	37.6
Evaporation		-	-	-	-	-	-	-	-	-	-	-	-	-	18.9
Growing Degrees	5	10.1	11.0	12.7	8.7	9.2	9.7	8.2	7.3	6.9	5.7	9.4	98.7	111.1	81.3
	10	5.1	6.0	7.7	3.7	4.2	4.7	3.2	2.3	1.9	0.7	4.4	43.7	56.1	30.0

3rd 10-day period (21-31/10/2019)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	-	-	14.7
Precipitation - Reference Evapotranspiration	-	-	22.9
Number of Rainy Days	2.0	6.0	3.8
Number of Dry Days	18.0	12.0	-

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

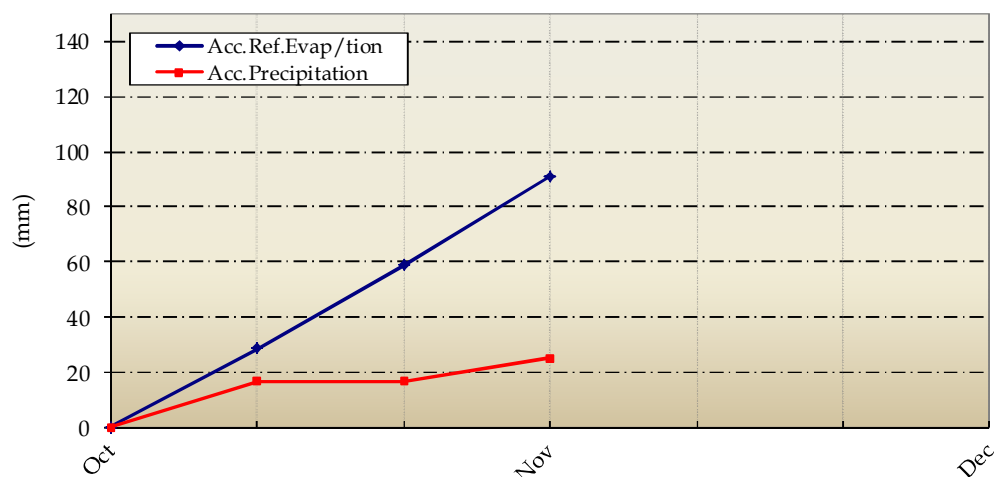
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



3rd 10-day period (21-31/10/2019)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	28.2	30.4	28.2	26.7	26.6	25.6	26.2	25.5	25.4	29.0	21.8	26.7	24.2	22.3
	Min	13.4	15.2	14.0	8.9	10.9	11.8	8.2	7.9	11.9	13.0	13.5	11.7	13.8	11.5
Relative Humidity	Max	88	60	76	87	87	84	75	83	88	90	91	83	90	-
	Min	33	16	18	27	29	34	26	39	36	32	63	32	50	-
Soil Temperature at 10 cm	06 UTC	21.0	21.0	20.5	20.3	19.4	19.6	19.0	18.6	28.8	19.3	19.6	20.6	18.8	16.7
	12 UTC	23.0	22.8	22.6	21.8	21.8	21.8	24.6	24.0	20.4	21.0	20.2	22.2	20.7	18.5
Sunshine Duration		9.2	11.1	9.8	11.1	9.4	9.6	9.7	9.5	9.3	9.1	2.4	9.1	5.9	5.9
Precipitation												8.6	8.6	9.7	43.6
Evaporation		4.9	5.3	5.6	4.0	4.0	4.4	2.8	3.2	3.9	4.7	0.0	42.8	43.0	36.3
Growing Degrees	5	15.8	17.8	16.1	12.8	13.8	13.7	12.2	11.7	13.7	16.0	12.7	156.2	154.3	130.7
	10	10.8	12.8	11.1	7.8	8.8	8.7	7.2	6.7	8.7	11.0	7.7	101.2	99.3	75.7

3rd 10-day period (21-31/10/2019)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	32.3	24.4	21.6
Precipitation - Reference Evapotranspiration	-23.7	-14.7	22.0
Number of Rainy Days	1.0	3.0	3.7
Number of Dry Days	20.0	12.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



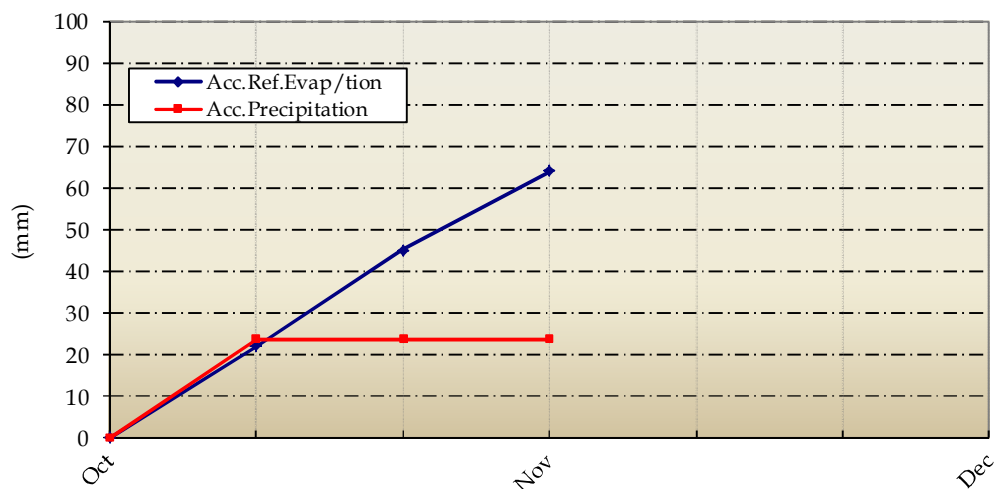
Larisa

3rd 10-day period (21-31/10/2019)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	26.4	26.8	26.0	26.0	25.9	25.6	26.2	23.2	23.3	23.2	20.5	24.8	21.8	18.9
	Min	11.4	10.0	7.5	6.6	5.6	6.2	6.6	7.8	6.0	7.0	14.0	8.1	9.7	8.3
Relative Humidity	Max	100	93	88	80	84	86	92	100	97	93	93	91	93	-
	Min	43	33	26	25	28	35	30	44	45	51	63	38	48	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-	14.6
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-	15.6
Sunshine Duration		6.7	6.7	6.8	6.3	6.2	6.0	6.2	5.8	5.8	4.0	1.2	5.6	4.7	4.4
Precipitation											0.0		0.0	5.5	23.9
Evaporation		4.9	3.9	5.1	4.3	3.9	4.2	1.1	3.3	3.2	1.5	2.6	38.0	30.1	24.8
Growing Degrees	5	13.9	13.4	11.8	11.3	10.8	10.9	11.4	10.5	9.7	10.1	12.3	125.9	118.1	94.1
	10	8.9	8.4	6.8	6.3	5.8	5.9	6.4	5.5	4.7	5.1	7.3	70.9	63.1	41.5

3rd 10-day period (21-31/10/2019)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	19.1	18.8	16.4
Precipitation - Reference Evapotranspiration	-19.1	-13.3	7.5
Number of Rainy Days	0.0	3.0	3.5
Number of Dry Days	23.0	6.0	-

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

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

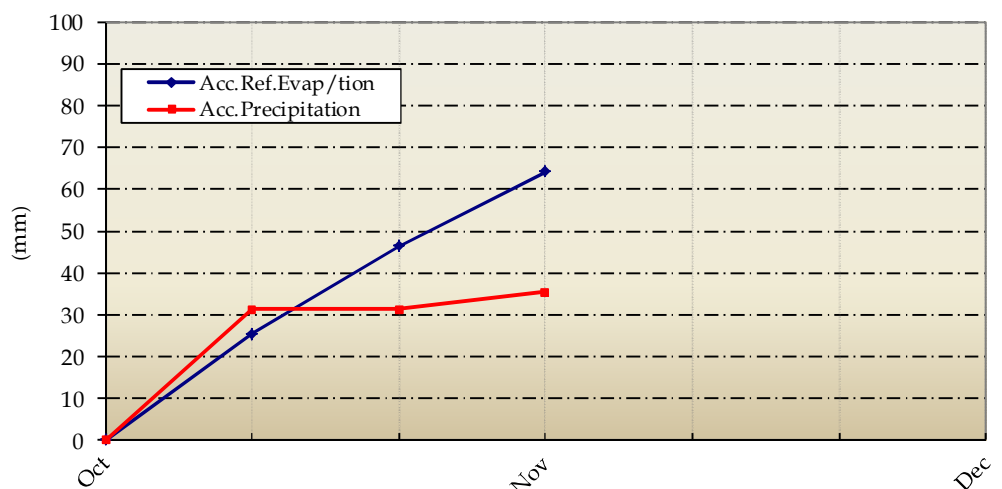


3rd 10-day period (21-31/10/2019)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	25.7	26.7	25.7	25.3	23.6	23.6	22.6	22.5	20.6	21.1	18.6	23.3	21.3	18.1
	Min	12.6	12.2	12.3	9.3	9.0	9.8	9.4	12.0	12.0	12.7	15.4	11.5	10.9	9.2
Relative Humidity	Max	94	92	88	85	80	87	92	93	93	95	97	91	76	-
	Min	43	43	39	27	44	46	57	52	72	60	77	51	44	-
Soil Temperature at 10 cm	06 UTC	19.0	18.8	18.8	18.0	17.4	17.2	17.0	18.0	17.8	18.0	18.2	18.0	17.1	13.8
	12 UTC	21.4	21.2	22.6	20.4	21.6	21.4	19.6	20.0	20.0	21.0	18.6	20.7	19.4	16.0
Sunshine Duration		8.2	8.9	9.4	9.2	8.8	8.5	9.0	6.3	6.5	4.9	0.0	7.2	5.3	4.6
Precipitation												4.1	4.1	0.0	21.1
Evaporation		-	-	-	-	-	-	-	-	-	-	-	-	33.8	29.7
Growing Degrees	5	14.2	14.5	14.0	12.3	11.3	11.7	11.0	12.3	11.3	11.9	12.0	136.4	122.3	95.5
	10	9.2	9.5	9.0	7.3	6.3	6.7	6.0	7.3	6.3	6.9	7.0	81.4	67.3	42.9

3rd 10-day period (21-31/10/2019)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	18.0	25.8	17.3
Precipitation - Reference Evapotranspiration	-13.9	-25.8	3.8
Number of Rainy Days	1.0	0.0	3.2
Number of Dry Days	22.0	19.0	-

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

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

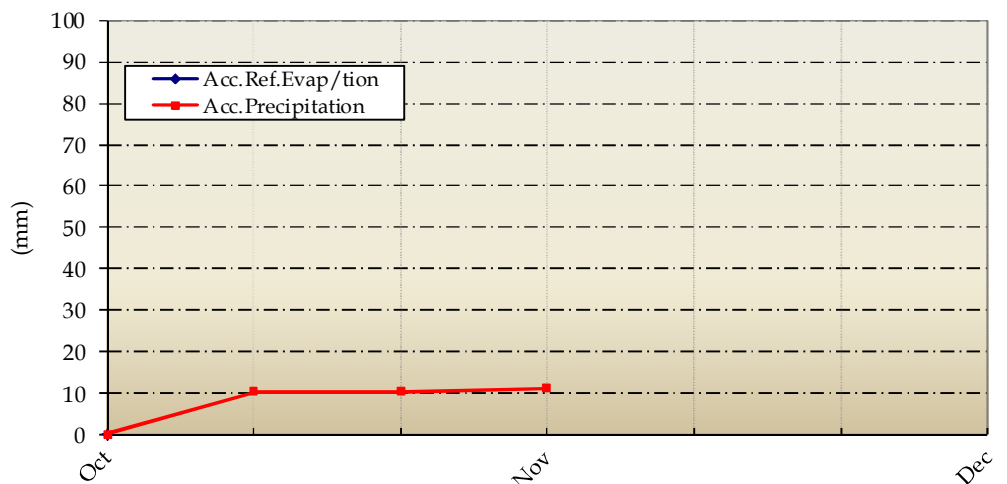


3rd 10-day period (21-31/10/2019)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	25.9	24.4	23.6	25.2	25.6	23.8	25.4	23.8	23.5	23.8	20.4	24.1	21.5	19.8
	Min	13.2	12.8	16.0	12.0	10.2	10.7	10.3	9.1	10.0	8.5	12.5	11.4	11.7	10.1
Relative Humidity	Max	99	87	73	73	89	93	95	98	99	100	99	91	96	-
	Min	33	39	31	28	28	36	28	35	34	34	66	36	49	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sunshine Duration		8.4	8.4	8.5	8.7	8.7	8.7	8.6	8.1	7.7	8.0	0.1	7.6	6.6	
Precipitation												0.9	0.9	3.9	27.5
Evaporation		-	-	-	-	-	-	-	-	-	-	-	-	-	-
Growing Degrees	5	14.6	13.6	14.8	13.6	12.9	12.3	12.9	11.5	11.8	11.2	11.5	140.4	127.3	
	10	9.6	8.6	9.8	8.6	7.9	7.3	7.9	6.5	6.8	6.2	6.5	85.4	72.3	

3rd 10-day period (21-31/10/2019)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	-	18.7	
Precipitation - Reference Evapotranspiration	-	-14.8	27.5
Number of Rainy Days	1.0	4.0	3.7
Number of Dry Days	22.0	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

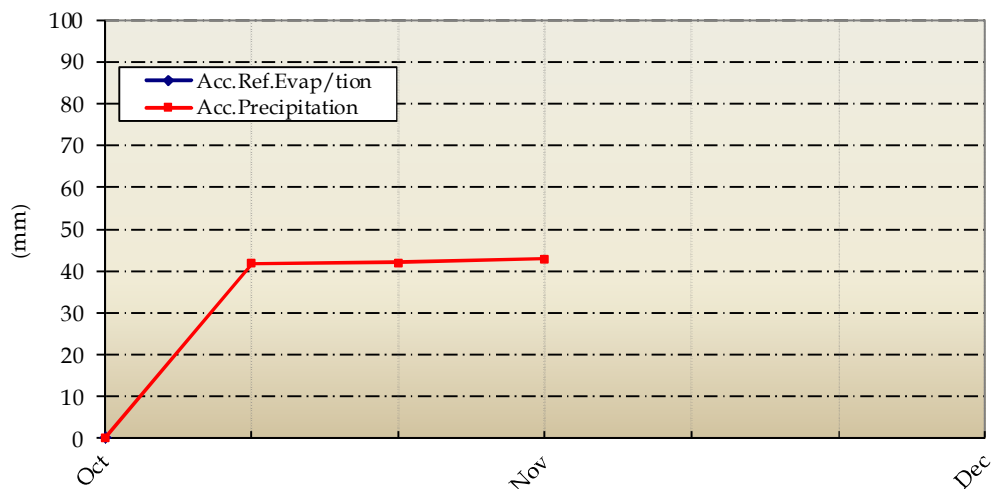


3rd 10-day period (21-31/10/2019)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	24.8	23.4	23.2	24.9	25.2	24.0	26.2	25.1	25.0	24.8	19.9	24.2	20.1	17.6
	Min	6.8	7.3	9.9	2.5	1.3	1.6	2.2	1.7	2.5	5.2	7.4	4.4	8.0	6.5
Relative Humidity	Max	99	91	90	93	89	89	89	95	97	95	99	93	99	-
	Min	27	24	30	14	11	19	13	18	12	31	58	23	49	-
Soil Temperature at 10 cm	06 UTC	15.2	15.0	15.0	13.0	12.2	-	-	-	11.8	12.2	13.8	13.5	13.6	12.8
	12 UTC	19.4	18.8	18.6	17.6	16.8	-	-	-	16.2	16.8	16.2	17.6	16.8	14.2
Sunshine Duration		8.7	9.2	9.2	9.2	9.2	9.2	9.3	9.3	8.9	8.3	2.6	8.5	6.1	5.3
Precipitation				0.0				0.0	0.0	0.0		0.8	0.8	6.7	39.1
Evaporation		2.6	4.9	3.3	2.9	-	-	-	-	2.1	2.8	1.0	-	22.3	23.9
Growing Degrees	5	10.8	10.4	11.6	8.7	8.3	7.8	9.2	8.4	8.8	10.0	8.7	102.5	99.7	77.8
	10	5.8	5.4	6.6	3.7	3.3	2.8	4.2	3.4	3.8	5.0	3.7	47.5	44.7	27.7

3rd 10-day period (21-31/10/2019)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	22.5	16.8	18.0
Precipitation - Reference Evapotranspiration	-21.7	-10.1	21.1
Number of Rainy Days	1.0	5.0	3.8
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





◆ **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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HELLENIC NATIONAL METEOROLOGICAL SERVICE

Division of Climatology-Applications

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