



AGROMETEOROLOGICAL BULLETIN

November 2019
2nd 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



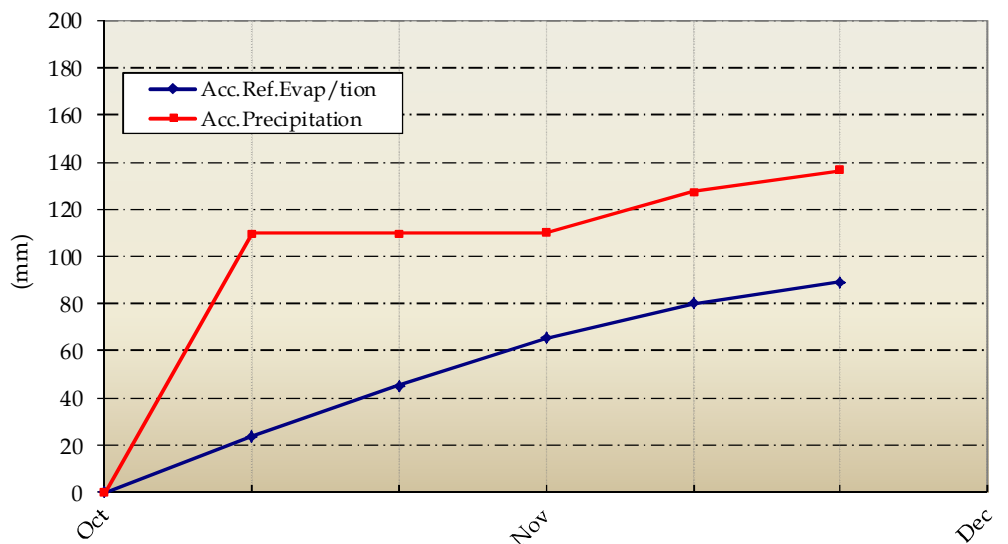
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Web addresses of HNMS
www.hnms.gr
www.emy.gov.gr
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2nd 10-day period (11-20/11/2019)		21	22	23	24	25	26	27	28	29	30	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	19.0	22.6	19.2	17.0	21.0	21.0	18.0	18.0	20.2	19.2	19.5	14.3	14.4
	Min	11.8	10.4	11.4	13.4	13.0	9.6	14.0	13.6	10.6	11.6	11.9	6.9	6.2
Relative Humidity	Max	98	92	89	96	97	98	90	93	98	89	94	88	-
	Min	74	54	69	89	70	56	71	80	66	66	70	54	-
Soil Temperature at 10 cm	06 UTC	16.4	14.2	15.2	15.4	14.8	15.0	15.2	14.6	14.6	14.4	15.0	11.7	9.7
	12 UTC	17.0	17.8	16.4	16.0	18.0	17.2	16.2	15.4	16.4	16.2	16.7	13.4	11.5
Sunshine Duration		0.3	7.7	0.0	0.0	5.8	7.0	0.0	0.8	3.6	4.3	3.0	3.5	3.9
Precipitation		0.4			5.0	3.9			0.0			9.3	30.7	29.1
Evaporation		0.6	0.7	0.5	1.9	0.0	1.6	0.8	0.8	0.2	0.9	8.0	17.4	18.6
Growing Degrees	5	10.4	11.5	10.3	10.2	12.0	10.3	11.0	10.8	10.4	10.4	107.3	55.8	54.2
	10	5.4	6.5	5.3	5.2	7.0	5.3	6.0	5.8	5.4	5.4	57.3	13.4	17.6

2nd 10-day period (11-20/11/2019)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	9.4	11.6	11.3
Precipitation - Reference Evapotranspiration	-0.1	19.1	17.8
Number of Rainy Days	3.0	4.0	2.9
Number of Dry Days	0.0	7.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

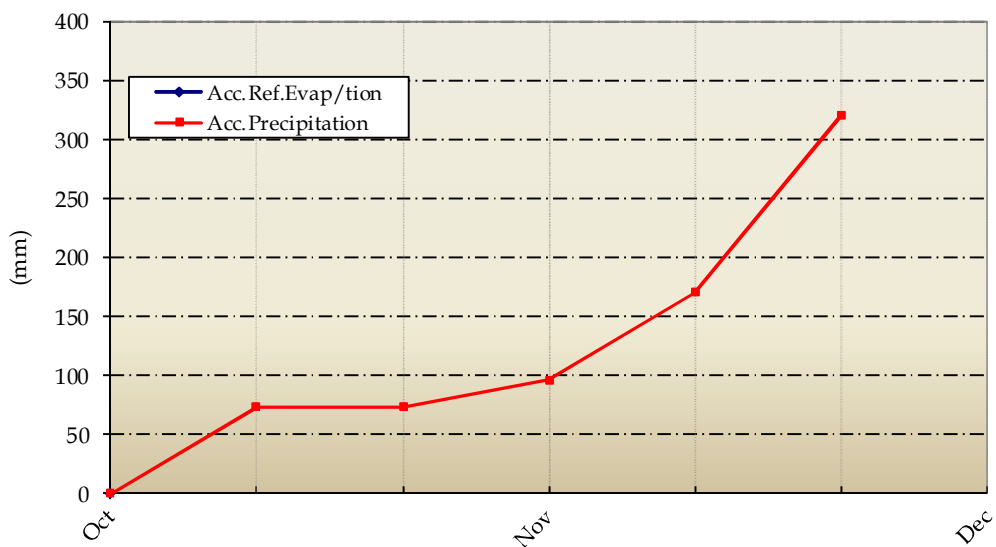


2nd 10-day period (11-20/11/2019)		21	22	23	24	25	26	27	28	29	30	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	21.8	24.7	21.6	22.0	21.5	22.8	23.2	22.7	23.9	19.9	22.4	19.4	18.6
	Min	11.1	10.6	14.2	12.0	13.0	13.6	10.5	13.6	11.3	13.5	12.3	8.1	9.7
Relative Humidity	Max	85	97	100	100	95	91	94	100	95	100	96	94	-
	Min	32	42	58	33	60	36	41	53	46	62	46	48	-
Soil Temperature at 10 cm	06 UTC	16.1	17.8	17.0	16.8	17.2	17.2	17.0	17.0	17.0	17.0	17.0	14.1	13.2
	12 UTC	19.2	19.8	19.6	17.6	18.0	18.0	17.2	17.8	17.8	18.6	18.4	16.0	15.2
Sunshine Duration		5.7	0.3	4.4	5.1	6.7	4.7	2.6	5.5	4.6	0.9	4.0	4.8	4.9
Precipitation		0.5	16.8	24.1	20.7	6.6			22.6		59.5	150.8	67.3	50.9
Evaporation		2.2	0.1	1.3	2.7	2.9	3.0	1.1	4.1	5.4	1.2	24.0	19.1	21.4
Growing Degrees	5	11.5	12.7	12.9	12.0	12.3	13.2	11.9	13.2	12.6	11.7	123.8	87.4	91.7
	10	6.5	7.7	7.9	7.0	7.3	8.2	6.9	8.2	7.6	6.7	73.8	37.4	42.4

2nd 10-day period (11-20/11/2019)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	-	12.5	11.8
Precipitation - Reference Evapotranspiration	-	54.8	39.1
Number of Rainy Days	7.0	4.0	4.2
Number of Dry Days	0.0	7.0	-

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

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



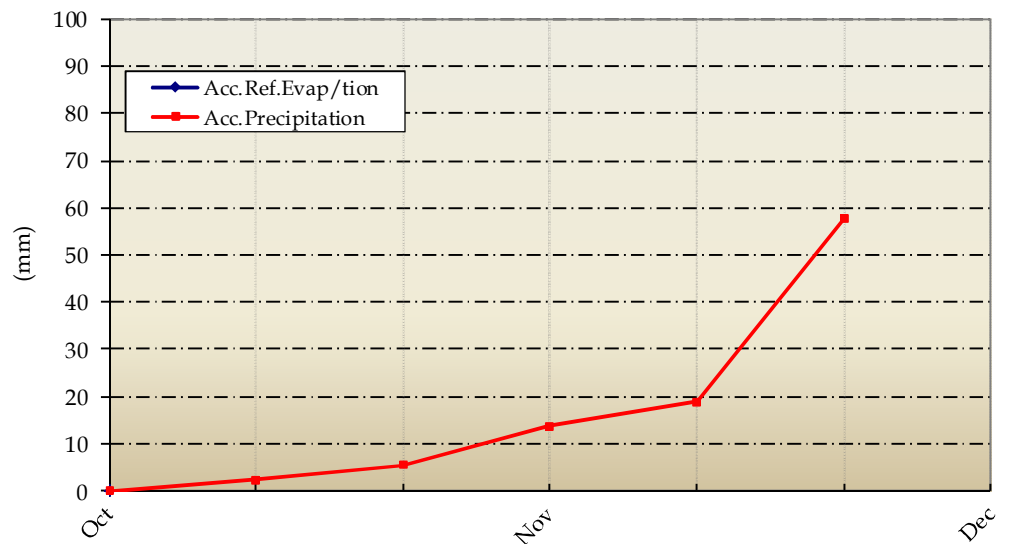
Iraklio

2nd 10-day period (11-20/11/2019)		21	22	23	24	25	26	27	28	29	30	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	24.0	29.0	20.0	21.4	22.6	21.8	21.0	22.6	25.0	24.4	23.2	20.0	19.7
	Min	19.2	18.8	20.0	15.0	14.6	15.0	14.6	14.6	17.6	15.0	16.4	15.3	13.2
Relative Humidity	Max	82	80	97	89	93	91	91	91	86	82	88	91	-
	Min	53	32	56	59	58	63	71	74	42	42	55	71	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
Sunshine Duration		8.3	5.2	0.1	8.1	8.5	6.9	2.4	5.8	8.0	8.3	6.2	4.0	4.9
Precipitation		0.0		34.4	4.3				0.1			38.8	57.2	22.2
Evaporation		3.8	3.0	2.1	0.3	2.9	1.9	0.9	0.7	3.2	4.0	22.8	30.5	33.6
Growing Degrees	5	16.6	18.9	15.0	13.2	13.6	13.4	12.8	13.6	16.3	14.7	148.1	126.4	114.3
	10	11.6	13.9	10.0	8.2	8.6	8.4	7.8	8.6	11.3	9.7	98.1	76.4	64.3

2nd 10-day period (11-20/11/2019)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	-	16.6	-
Precipitation - Reference Evapotranspiration	-	40.6	22.2
Number of Rainy Days	3.0	2.0	2.7
Number of Dry Days	10.0	5.0	-

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Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

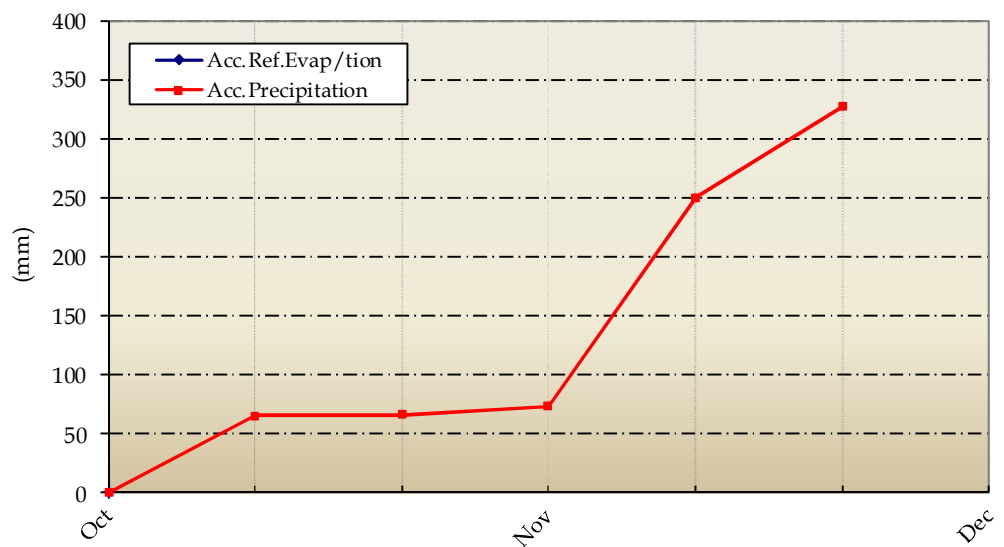


2nd 10-day period (11-20/11/2019)		21	22	23	24	25	26	27	28	29	30	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	16.0	-	15.6	15.6	17.6	19.0	17.4	16.8	17.4	16.2	16.8	15.0	13.9
	Min	3.3	8.7	11.6	9.0	9.0	8.0	4.2	9.2	3.6	9.6	7.6	3.6	4.6
Relative Humidity	Max	100	98	100	100	97	100	100	100	100	100	100	99	-
	Min	60	43	73	77	70	62	58	66	63	79	65	57	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	8.9
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	10.1
Sunshine Duration		4.9	0.0	0.3	1.7	2.8	2.3	2.9	4.3	0.0	4.2	2.3	2.9	3.0
Precipitation			0.2	20.9	3.1	0.0			19.7	8.7	24.2	76.8	38.9	63.6
Evaporation		-	-	-	-	-	-	-	-	-	-	-	-	13.4
Growing Degrees	5	4.7	-	8.6	7.3	8.3	8.5	5.8	8.0	5.5	7.9	-	42.9	44.8
	10	0.0	-	3.6	2.3	3.3	3.5	0.8	3.0	0.5	2.9	-	3.9	8.8

2nd 10-day period (11-20/11/2019)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	-	-	7.9
Precipitation - Reference Evapotranspiration	-	-	55.7
Number of Rainy Days	6.0	5.0	4.4
Number of Dry Days	1.0	7.0	-

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

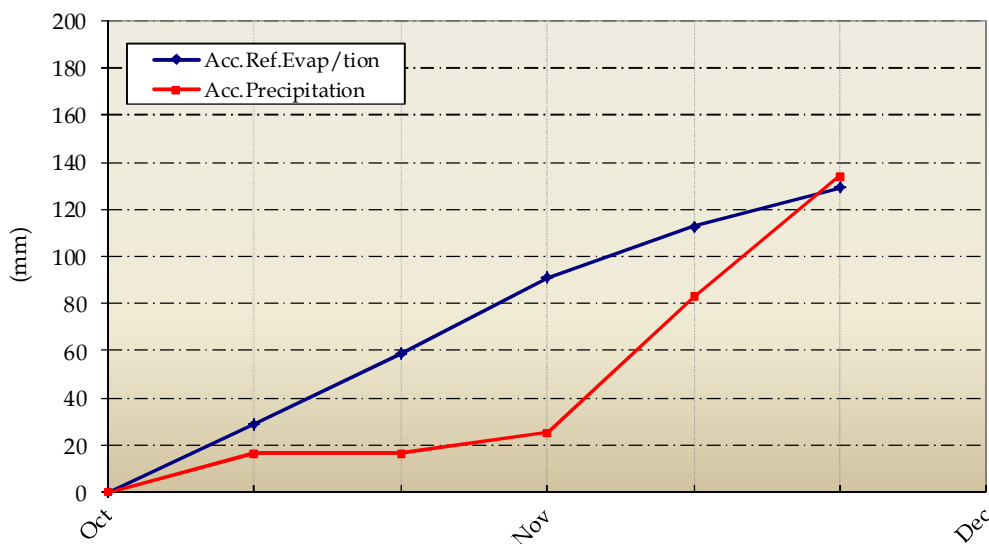
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



2nd 10-day period (11-20/11/2019)		21	22	23	24	25	26	27	28	29	30	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	21.6	26.4	19.1	21.1	21.8	24.0	23.3	20.6	19.8	21.0	21.9	20.5	19.5
	Min	0.0	0.0	14.8	11.2	0.0	11.2	11.9	12.6	12.3	15.2	8.9	10.4	9.3
Relative Humidity	Max	86	93	92	93	92	90	92	92	95	92	92	87	-
	Min	32	31	75	55	55	44	40	69	75	65	54	47	-
Soil Temperature at 10 cm	06 UTC	16.6	16.4	17.4	16.2	17.0	16.0	16.4	16.4	16.0	16.8	16.5	14.7	14.0
	12 UTC	17.6	17.2	17.6	17.4	17.6	17.0	17.4	17.2	16.8	17.0	17.3	16.1	15.4
Sunshine Duration		4.5	0.0	0.0	4.4	6.6	4.3	4.6	2.3	1.1	0.0	2.8	5.2	4.6
Precipitation		0.1	0.0	23.3	2.9	0.9			2.9		21.2	51.3	73.7	55.3
Evaporation		0.0	9.6	0.8	0.9	1.8	1.2	0.5	0.0	4.0	1.8	20.6	20.2	22.8
Growing Degrees	5	5.8	8.2	12.0	11.2	5.9	12.6	12.6	11.6	11.1	13.1	104.0	104.4	93.9
	10	0.8	3.2	7.0	6.2	0.9	7.6	7.6	6.6	6.1	8.1	54.0	54.4	44.2

2nd 10-day period (11-20/11/2019)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	16.7	18.1	13.4
Precipitation - Reference Evapotranspiration	34.6	55.6	41.9
Number of Rainy Days	6.0	4.0	3.8
Number of Dry Days	0.0	7.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



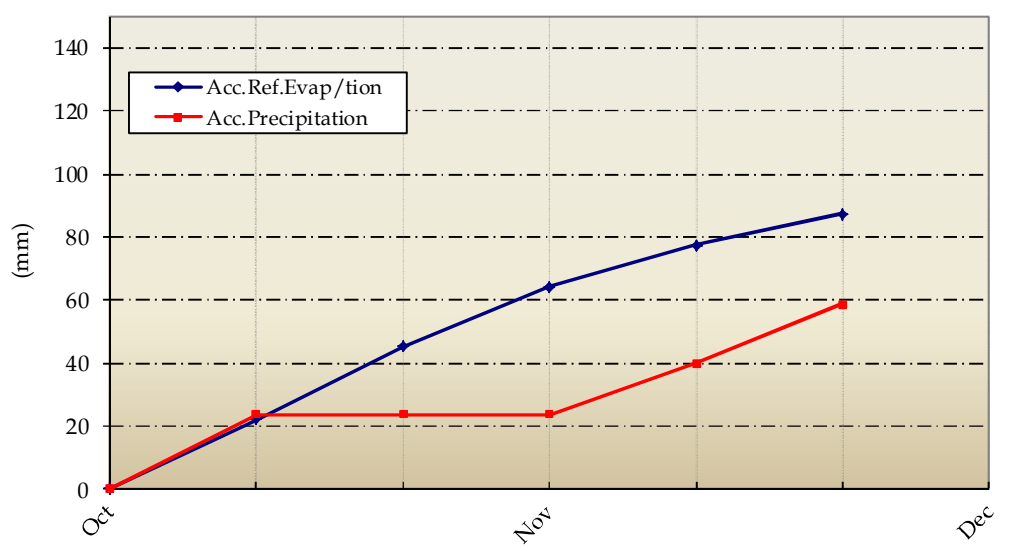
Larisa

2nd 10-day period (11-20/11/2019)		21	22	23	24	25	26	27	28	29	30	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	19.8	21.0	18.6	19.5	20.5	18.6	17.0	20.8	19.8	20.0	19.6	14.8	15.3
	Min	6.0	11.0	13.3	10.6	8.0	7.4	8.4	12.1	8.4	13.9	9.9	6.2	5.5
Relative Humidity	Max	97	99	98	98	98	99	99	98	98	98	98	93	-
	Min	49	71	69	66	55	68	66	56	70	70	64	62	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	10.9
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	11.6
Sunshine Duration		4.9	0.5	1.0	3.3	5.3	2.9	1.2	4.4	2.7	0.7	2.7	3.0	3.5
Precipitation			4.9	12.6					0.1	0.1	1.2	18.9	24.5	21.2
Evaporation		2.8	0.2	0.4	0.3	3.1	1.2	0.5	1.0	9.7	12.2	31.4	20.8	13.7
Growing Degrees	5	7.9	11.0	11.0	10.1	9.3	8.0	7.7	11.5	9.1	12.0	97.4	54.6	54.7
	10	2.9	6.0	6.0	5.1	4.3	3.0	2.7	6.5	4.1	7.0	47.4	10.7	14.5

2nd 10-day period (11-20/11/2019)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	10.0	8.9	8.8
Precipitation - Reference Evapotranspiration	8.9	15.6	12.4
Number of Rainy Days	5.0	4.0	3.4
Number of Dry Days	1.0	6.0	-

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

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



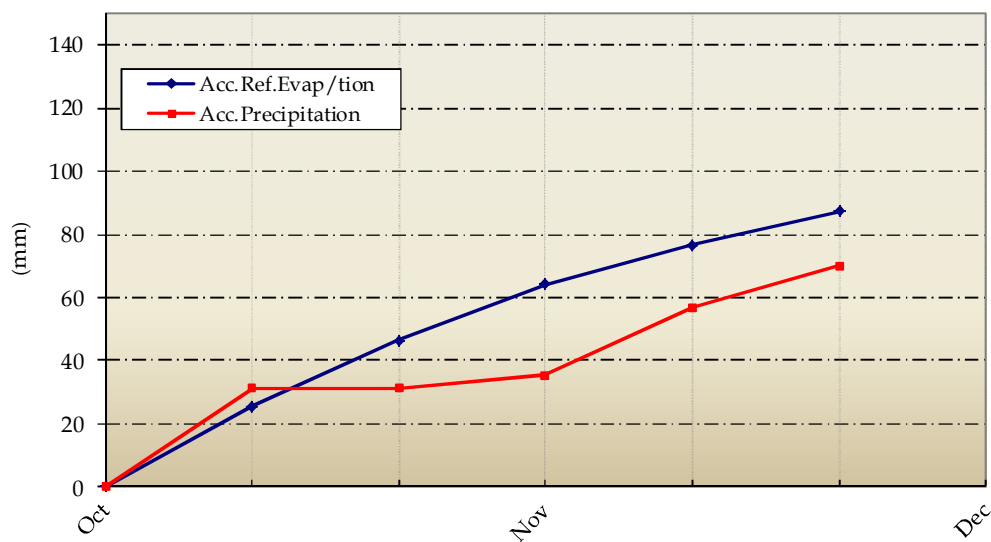
Mikra

2nd 10-day period (11-20/11/2019)		21	22	23	24	25	26	27	28	29	30	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	19.2	22.1	19.6	19.7	19.4	19.2	18.1	20.8	19.3	20.4	19.8	15.4	14.7
	Min	8.7	12.4	15.6	13.2	10.7	10.1	10.3	13.8	10.1	15.0	12.0	7.9	6.8
Relative Humidity	Max	94	97	92	97	97	96	99	96	95	93	96	81	-
	Min	62	54	70	68	71	70	75	63	75	71	68	50	-
Soil Temperature at 10 cm	06 UTC	15.2	16.4	17.4	16.2	16.0	15.2	15.2	16.2	15.4	16.2	15.9	12.9	10.3
	12 UTC	17.4	17.6	17.2	18.0	17.2	16.8	16.4	17.2	16.4	16.8	17.1	14.5	12.2
Sunshine Duration		7.5	0.9	0.0	6.7	7.5	2.1	0.9	4.6	5.5	1.7	3.7	4.0	3.5
Precipitation			2.1	5.1	0.0			0.8	2.3		3.0	13.3	12.5	21.1
Evaporation		-	-	-	-	-	-	-	-	-	-	-	28.2	18.7
Growing Degrees	5	9.0	12.3	12.6	11.5	10.1	9.7	9.2	12.3	9.7	12.7	108.9	66.8	57.6
	10	4.0	7.3	7.6	6.5	5.1	4.7	4.2	7.3	4.7	7.7	58.9	17.4	17.1

2nd 10-day period (11-20/11/2019)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	10.6	13.7	11.2
Precipitation - Reference Evapotranspiration	2.7	-1.2	9.9
Number of Rainy Days	5.0	5.0	3.0
Number of Dry Days	1.0	7.0	-

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Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



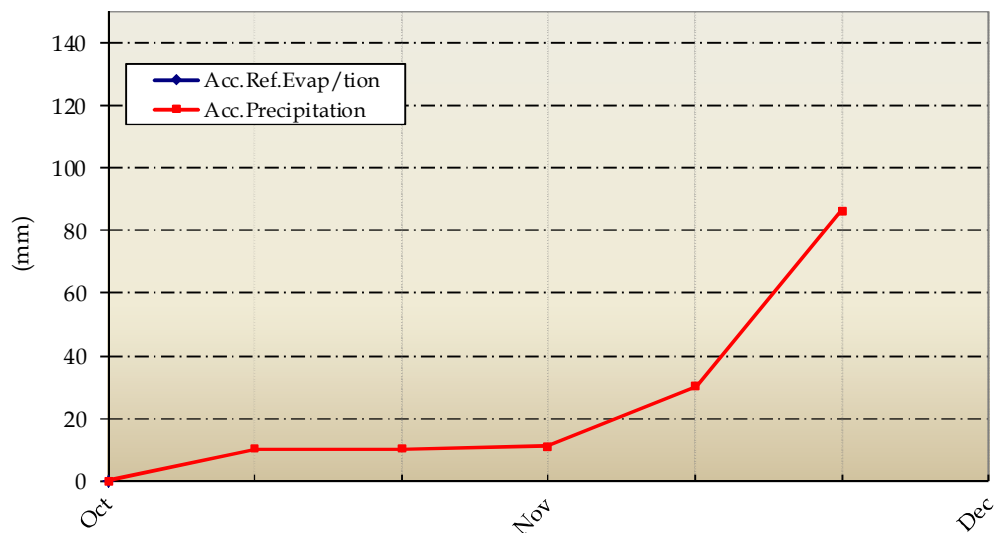
Tanagra

2nd 10-day period (11-20/11/2019)		21	22	23	24	25	26	27	28	29	30	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	20.4	23.6	15.3	21.2	22.4	20.6	19.4	22.4	20.0	19.1	20.4	15.2	17.8
	Min	9.0	12.4	15.1	9.1	9.3	9.4	11.4	11.7	10.1	12.3	11.0	8.9	8.3
Relative Humidity	Max	100	100	100	100	99	99	100	100	100	100	100	96	-
	Min	49	48	75	50	37	53	62	49	65	70	56	65	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
Sunshine Duration		6.3	5.4	0.0	7.7	8.1	6.2	1.8	5.6	4.0	0.3	4.5	2.6	
Precipitation				36.6	0.7				2.3		16.9	56.5	27.8	21.4
Evaporation		-	-	-	-	-	-	-	-	-	-	-	-	-
Growing Degrees	5	9.7	13.0	10.2	10.2	10.9	10.0	10.4	12.1	10.1	10.7	107.1	70.3	
	10	4.7	8.0	5.2	5.2	5.9	5.0	5.4	7.1	5.1	5.7	57.1	22.4	

2nd 10-day period (11-20/11/2019)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	-	9.4	
Precipitation - Reference Evapotranspiration	-	18.4	21.4
Number of Rainy Days	4.0	2.0	3.7
Number of Dry Days	2.0	7.0	-

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

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

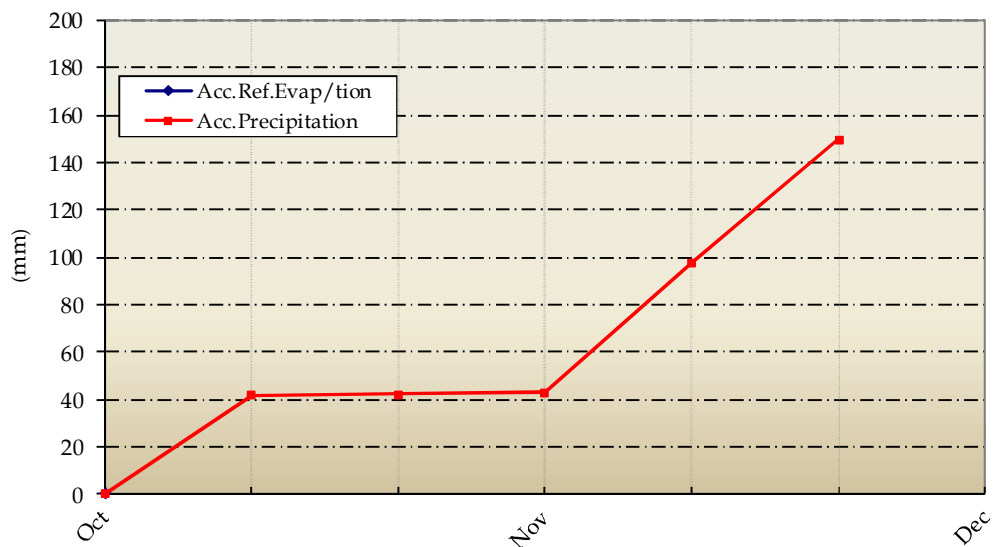


2nd 10-day period (11-20/11/2019)		21	22	23	24	25	26	27	28	29	30	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	17.3	19.1	12.9	17.1	17.9	18.7	17.2	17.7	16.3	13.0	16.7	13.8	14.9
	Min	0.7	12.2	11.6	7.7	6.3	5.1	4.1	7.8	5.3	10.6	7.1	3.6	4.4
Relative Humidity	Max	100	98	100	100	97	100	100	100	100	100	100	99	-
	Min	43	66	82	50	53	37	59	53	76	95	61	61	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	12.2	11.6	12.8	12.2	8.7	9.7
	12 UTC	-	-	-	-	-	-	-	14.4	13.8	13.2	13.8	11.2	10.8
Sunshine Duration		-	1.1	0.0	3.7	6.5	3.5	5.0	1.7	0.8	0.0	2.5	4.2	4.5
Precipitation		0.0	5.1	14.0	0.1	0.1	0.0	0.0	0.3	4.1	28.1	51.8	73.4	45.7
Evaporation		-	-	-	-	-	-	-	-	0.1	-	-	9.1	15.6
Growing Degrees	5	4.0	10.7	7.3	7.4	7.1	6.9	5.7	7.8	5.8	6.8	69.3	36.6	46.8
	10	0.0	5.7	2.3	2.4	2.1	1.9	0.7	2.8	0.8	1.8	20.3	3.8	10.1

2nd 10-day period (11-20/11/2019)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	-	9.4	10.5
Precipitation - Reference Evapotranspiration	-	64.0	35.2
Number of Rainy Days	7.0	4.0	4.0
Number of Dry Days	1.0	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





◆ **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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