



AGROMETEOROLOGICAL BULLETIN

*October 2019
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



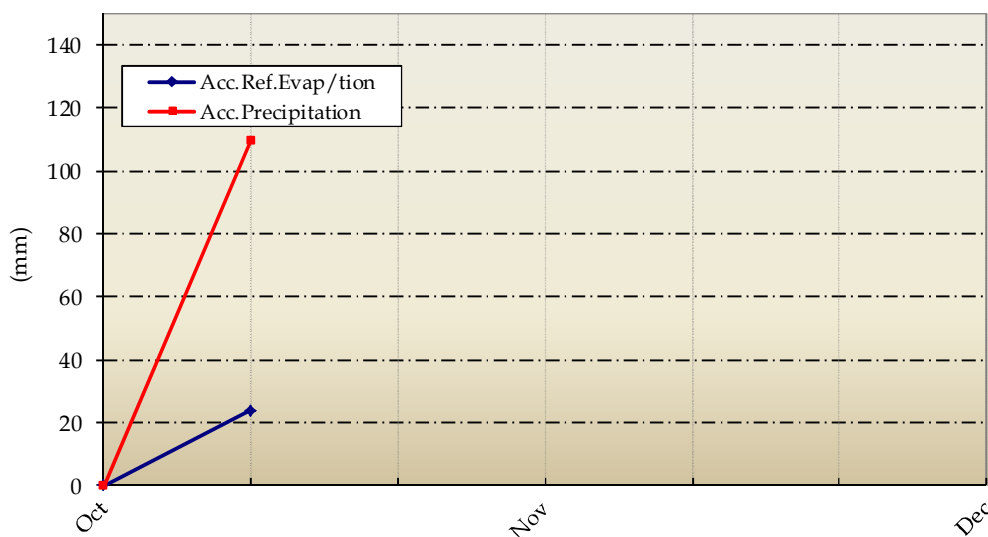
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1st 10-day period (1-10/10/2019)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	31.6	29.6	25.6	24.6	20.6	21.4	18.4	16.2	22.0	23.2	23.3	22.8	22.8
	Min	13.6	13.4	14.6	16.2	14.4	11.8	13.2	12.2	11.2	14.2	13.5	13.0	11.7
Relative Humidity	Max	87	95	98	96	98	93	85	88	90	91	92	86	-
	Min	26	39	66	73	60	51	52	62	43	61	53	48	-
Soil Temperature at 10 cm	06 UTC	20.4	21.2	22.0	23.4	19.2	17.6	17.0	15.4	14.4	16.6	18.7	16.6	17.4
	12 UTC	27.2	27.0	26.0	24.0	21.0	21.0	17.0	15.8	19.6	21.0	22.0	20.3	20.5
Sunshine Duration		10.4	10.4	7.4	1.0	3.6	9.4	0.0	0.0	10.7	8.7	6.2	8.3	6.7
Precipitation					66.0	36.8	4.8	0.0	2.2		0.0	109.8	23.5	17.2
Evaporation		6.1	4.3	2.7	2.4	1.4	3.6	2.1	0.9	2.7	2.9	29.1	38.7	48.1
Growing Degrees	5	17.6	16.5	15.1	15.4	12.5	11.6	10.8	9.2	11.6	13.7	134.0	128.6	122.8
	10	12.6	11.5	10.1	10.4	7.5	6.6	5.8	4.2	6.6	8.7	84.0	78.6	73.0

1st 10-day period (1-10/10/2019)	Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	23.8	24.4
Precipitation - Reference Evapotranspiration	86.0	-0.9
Number of Rainy Days	4.0	2.0
Number of Dry Days	9.0	0.0

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

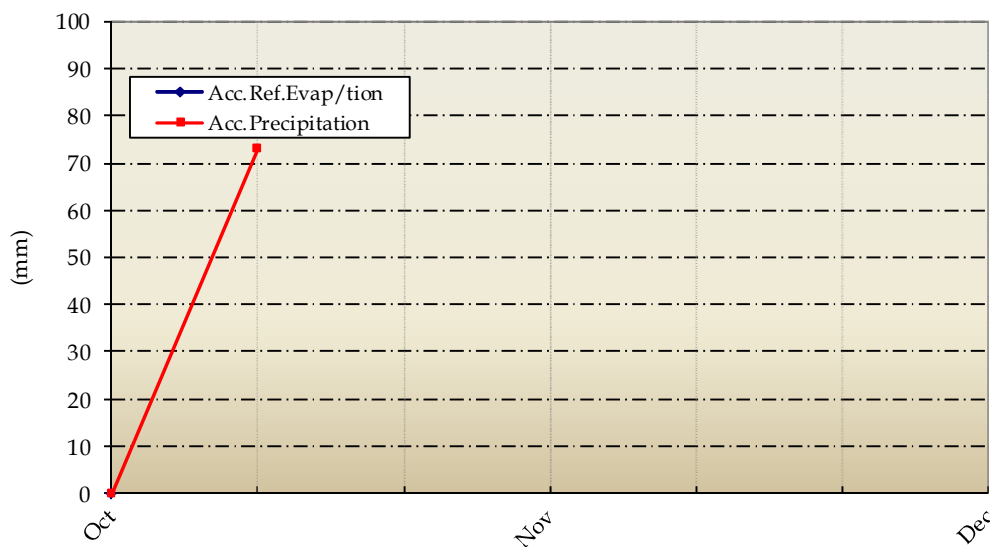


1st 10-day period (1-10/10/2019)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	27.4	28.4	26.3	27.0	24.0	25.6	22.0	25.0	27.0	26.3	25.9	26.7	25.6
	Min	17.1	18.2	16.5	17.0	17.0	16.6	17.6	16.7	12.9	14.6	16.4	14.4	14.3
Relative Humidity	Max	100	100	98	100	80	100	100	100	100	100	98	94	-
	Min	50	44	44	42	32	57	54	52	50	46	47	41	-
Soil Temperature at 10 cm	06 UTC	24.2	24.4	24.4	22.4	21.6	22.0	22.6	21.3	21.2	21.2	22.5	21.5	20.5
	12 UTC	25.6	25.0	25.4	26.0	22.8	23.8	22.6	23.0	22.6	23.6	24.0	24.4	23.8
Sunshine Duration		10.0	9.4	5.2	4.7	10.0	6.1	5.6	2.5	9.6	2.4	6.6	8.0	7.7
Precipitation				22.3	22.7		3.1	7.2	16.8		0.9	73.0	11.5	23.2
Evaporation		4.2	3.3	7.3	12.7	4.6	4.1	7.9	1.2	3.0	5.0	53.3	39.9	42.9
Growing Degrees	5	17.3	18.3	16.4	17.0	15.5	16.1	14.8	15.9	15.0	15.5	161.6	155.5	149.6
	10	12.3	13.3	11.4	12.0	10.5	11.1	9.8	10.9	10.0	10.5	111.6	105.5	99.6

1st 10-day period (1-10/10/2019)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	-	24.6	26.8
Precipitation - Reference Evapotranspiration	-	-13.1	-3.6
Number of Rainy Days	6.0	2.0	2.2
Number of Dry Days	8.0	2.0	-

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

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

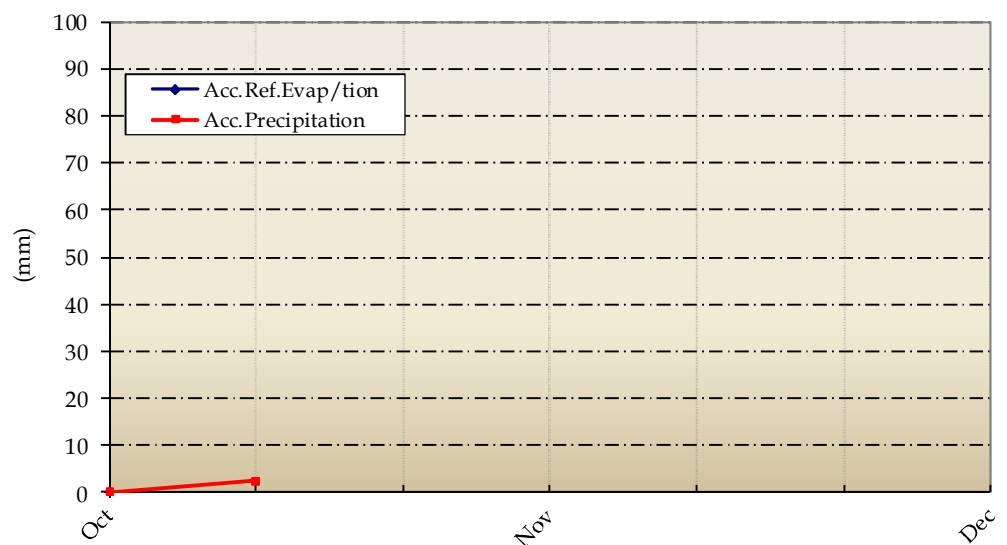


1st 10-day period (1-10/10/2019)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	28.0	26.4	30.8	33.4	27.2	26.2	29.6	26.2	23.8	24.4	27.6	24.6	24.6
	Min	18.0	20.0	19.6	23.2	19.8	18.6	19.6	20.4	20.2	17.8	19.7	18.6	17.5
Relative Humidity	Max	90	90	86	74	81	83	83	90	92	93	86	88	-
	Min	55	72	37	29	41	51	36	58	72	73	52	65	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
Sunshine Duration		12.2	9.6	10.3	7.9	8.6	7.8	6.6	4.4	2.8	7.4	7.8	8.6	7.9
Precipitation									2.4	0.0		2.4	0.0	6.0
Evaporation		2.5	2.1	7.8	8.0	5.1	3.8	3.0	2.8	0.9	3.2	39.2	36.1	53.7
Growing Degrees	5	18.0	18.2	20.2	23.3	18.5	17.4	19.6	18.3	17.0	16.1	186.6	166.3	160.1
	10	13.0	13.2	15.2	18.3	13.5	12.4	14.6	13.3	12.0	11.1	136.6	116.3	110.1

1st 10-day period (1-10/10/2019)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	-	31.0	-
Precipitation - Reference Evapotranspiration	-	-31.0	6.0
Number of Rainy Days	1.0	0.0	0.9
Number of Dry Days	82.0	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



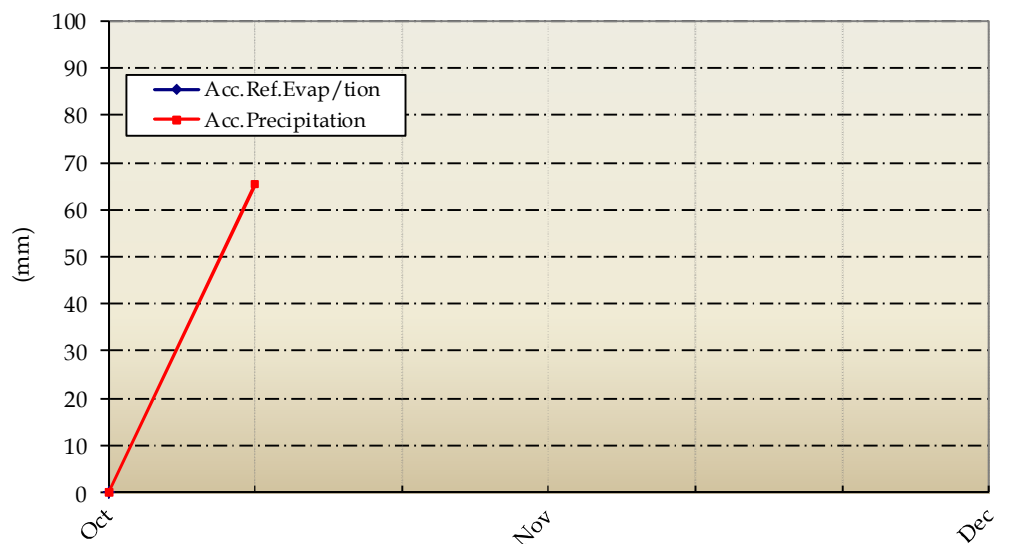
Ioannina

1st 10-day period (1-10/10/2019)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	28.2	27.0	20.0	21.2	20.0	23.0	18.6	21.4	23.8	21.2	22.4	23.6	22.8
	Min	11.4	8.2	14.2	8.2	10.4	10.8	8.8	13.0	9.0	10.0	10.4	10.7	10.0
Relative Humidity	Max	100	100	100	100	93	100	95	80	100	100	97	98	-
	Min	33	43	88	70	52	40	70	45	46	69	56	44	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	15.6
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	18.3
Sunshine Duration		6.1	7.5	0.7	3.7	5.8	8.5	0.7	5.5	8.3	0.9	4.8	5.5	5.7
Precipitation				24.5	37.2		0.1	0.2	0.8		2.7	65.5	15.6	25.8
Evaporation		-	-	-	-	-	-	-	-	-	-	-	-	32.1
Growing Degrees	5	14.8	12.6	12.1	9.7	10.2	11.9	8.7	12.2	11.4	10.6	114.2	121.5	114.5
	10	9.8	7.6	7.1	4.7	5.2	6.9	3.7	7.2	6.4	5.6	64.2	71.5	64.7

1st 10-day period (1-10/10/2019)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	-	-	21.0
Precipitation - Reference Evapotranspiration	-	-	4.8
Number of Rainy Days	6.0	7.0	2.6
Number of Dry Days	8.0	0.0	-

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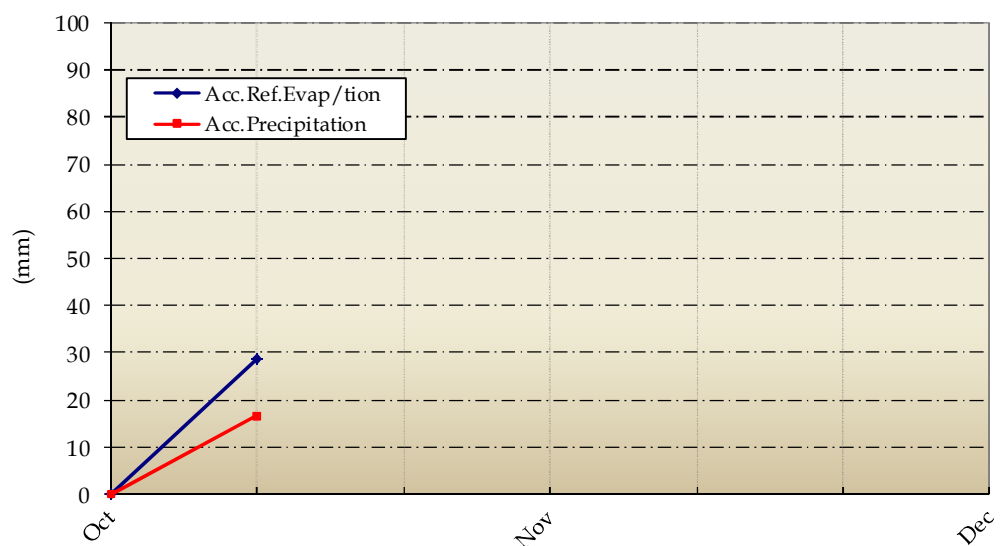
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



1st 10-day period (1-10/10/2019)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	29.0	28.0	27.6	27.8	25.4	24.0	23.1	25.1	26.8	24.6	26.1	26.6	26.1
	Min	17.2	15.5	16.1	18.8	16.4	14.2	15.8	17.5	16.1	17.0	16.5	15.8	13.8
Relative Humidity	Max	90	92	90	90	91	90	90	91	85	90	90	88	-
	Min	38	41	54	49	38	59	57	55	38	62	49	44	-
Soil Temperature at 10 cm	06 UTC	24.0	23.4	23.2	24.0	22.0	21.0	21.6	21.2	20.2	21.0	22.2	20.8	20.0
	12 UTC	26.2	26.2	25.2	24.8	29.6	22.4	29.6	22.5	22.6	22.6	25.2	22.8	22.6
Sunshine Duration		10.5	10.2	8.5	4.1	11.3	2.7	2.9	1.5	10.3	0.3	6.2	7.0	7.4
Precipitation					6.9	0.0		6.7	2.7		0.3	16.6	9.8	17.8
Evaporation		3.2	4.6	3.8	1.7	8.0	4.6	0.0	2.0	4.2	0.1	32.2	34.0	46.9
Growing Degrees	5	18.1	16.8	16.9	18.3	15.9	14.1	14.5	16.3	16.5	15.8	163.0	162.0	149.4
	10	13.1	11.8	11.9	13.3	10.9	9.1	9.5	11.3	11.5	10.8	113.0	112.0	99.4

1st 10-day period (1-10/10/2019)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	28.8	29.4	28.3
Precipitation - Reference Evapotranspiration	-12.2	-19.6	-10.5
Number of Rainy Days	4.0	6.0	2.3
Number of Dry Days	9.0	1.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



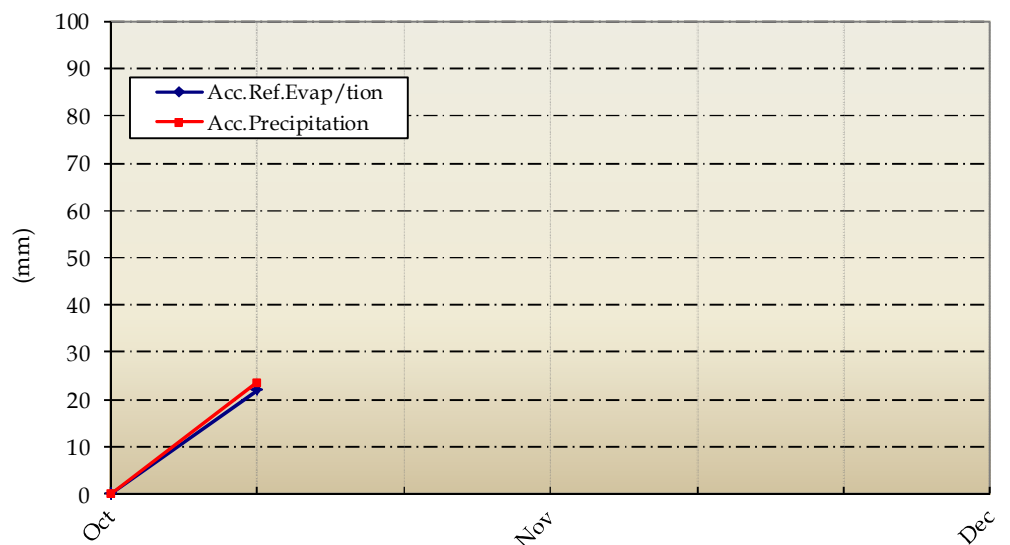
Larisa

1st 10-day period (1-10/10/2019)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	31.6	30.6	26.8	21.6	24.0	25.6	19.4	17.6	22.2	23.4	24.3	23.9	25.0
	Min	13.6	13.7	14.0	14.4	12.4	12.2	13.0	14.5	13.9	11.2	13.3	11.0	11.6
Relative Humidity	Max	87	96	97	99	99	86	94	91	96	98	94	95	-
	Min	24	40	41	66	41	35	54	72	55	60	49	44	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	19.3
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	20.9
Sunshine Duration		7.4	7.1	1.5	3.3	5.9	7.8	0.0	0.0	4.7	3.3	4.1	4.8	6.2
Precipitation					17.7			2.7	3.3			23.7	3.5	10.5
Evaporation		8.6	6.9	3.1	3.7	1.9	2.4	0.0	2.0	1.2	11.2	41.0	38.2	41.2
Growing Degrees	5	17.6	17.2	15.4	13.0	13.2	13.9	11.2	11.1	13.1	12.3	137.9	124.1	133.0
	10	12.6	12.2	10.4	8.0	8.2	8.9	6.2	6.1	8.1	7.3	87.9	74.1	83.0

1st 10-day period (1-10/10/2019)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	22.0	22.7	26.4
Precipitation - Reference Evapotranspiration	1.7	-19.2	-15.9
Number of Rainy Days	3.0	3.0	2.1
Number of Dry Days	9.0	0.0	-

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

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



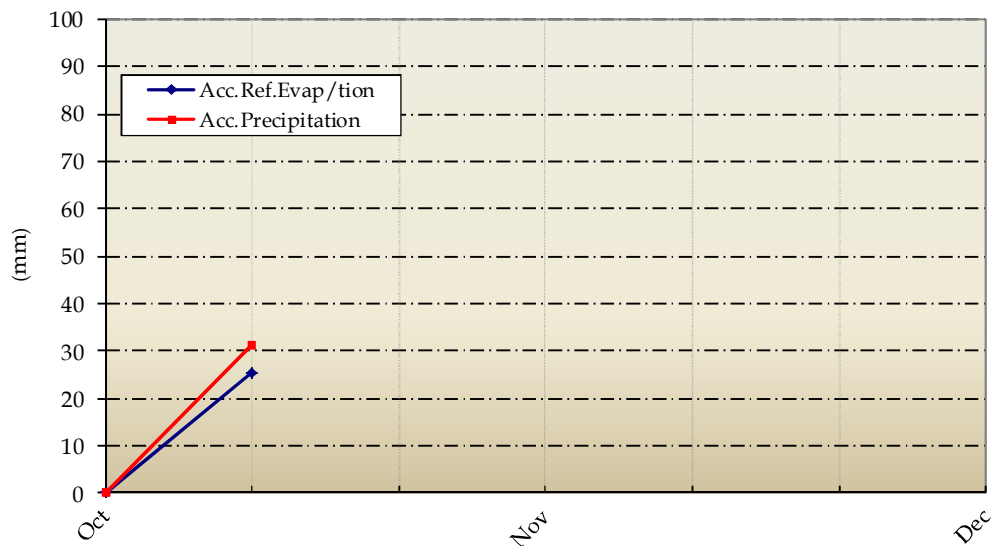
Mikra

1st 10-day period (1-10/10/2019)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	30.4	28.3	26.0	22.4	23.4	24.5	18.2	20.1	22.4	22.4	23.8	23.7	23.5
	Min	16.0	15.8	17.0	16.8	16.0	12.7	15.0	14.8	14.5	14.0	15.3	13.5	12.8
Relative Humidity	Max	91	90	95	96	84	92	95	83	92	95	91	82	-
	Min	42	45	58	58	39	33	72	54	55	73	53	42	-
Soil Temperature at 10 cm	06 UTC	22.0	22.4	23.0	22.0	18.0	18.8	19.6	17.8	18.4	18.4	20.0	19.4	18.4
	12 UTC	25.4	25.4	25.2	21.4	20.2	21.0	19.4	19.0	19.2	20.8	21.7	22.5	21.9
Sunshine Duration		9.7	9.8	4.3	3.0	10.3	9.9	0.0	1.3	8.9	5.0	6.2	7.2	6.2
Precipitation					20.6			7.5	3.2			31.3	0.1	9.7
Evaporation		-	-	-	-	-	-	-	-	-	-	-	50.3	40.2
Growing Degrees	5	18.2	17.1	16.5	14.6	14.7	13.6	11.6	12.5	13.5	13.2	145.4	136.0	131.6
	10	13.2	12.1	11.5	9.6	9.7	8.6	6.6	7.5	8.5	8.2	95.4	86.0	81.6

1st 10-day period (1-10/10/2019)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	25.5	26.1	25.5
Precipitation - Reference Evapotranspiration	5.8	-26.0	-15.8
Number of Rainy Days	3.0	1.0	1.7
Number of Dry Days	9.0	0.0	-

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

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



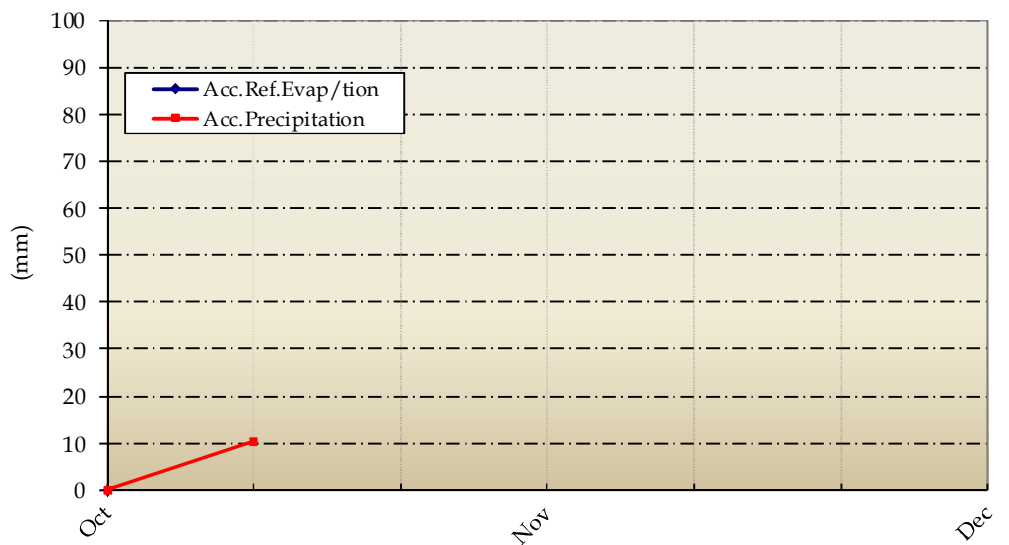
Tanagra

1st 10-day period (1-10/10/2019)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	30.4	29.1	29.5	28.2	26.5	25.8	20.2	19.6	23.9	25.6	25.9	23.0	24.7
	Min	16.5	15.6	15.1	17.4	12.9	12.2	17.2	16.4	13.0	12.1	14.8	13.3	12.9
Relative Humidity	Max	93	82	91	99	100	78	98	96	97	97	93	96	-
	Min	29	35	33	46	21	31	66	61	43	47	41	42	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
Sunshine Duration		10.0	10.2	6.5	1.7	9.8	10.4	0.0	0.0	10.0	4.3	6.3	7.6	
Precipitation					7.1			1.4	1.8	0.0		10.3	23.3	9.2
Evaporation		-	-	-	-	-	-	-	-	-	-	-	-	-
Growing Degrees	5	18.5	17.4	17.3	17.8	14.7	14.0	13.7	13.0	13.5	13.9	153.6	131.7	
	10	13.5	12.4	12.3	12.8	9.7	9.0	8.7	8.0	8.5	8.9	103.6	81.7	

1st 10-day period (1-10/10/2019)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	-	24.3	
Precipitation - Reference Evapotranspiration	-	-1.0	9.2
Number of Rainy Days	3.0	1.0	2.1
Number of Dry Days	9.0	0.0	-

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Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

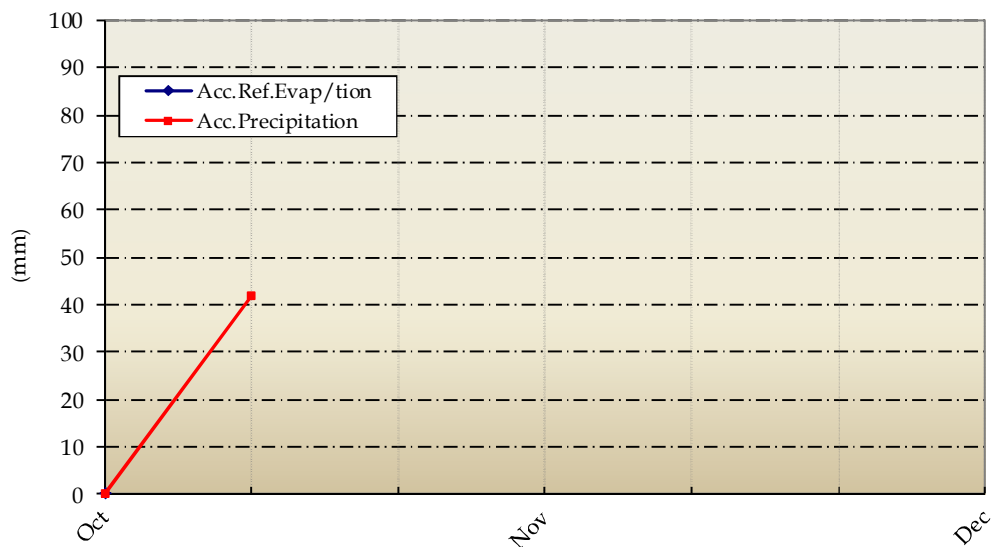


1st 10-day period (1-10/10/2019)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	28.6	26.7	24.5	24.1	21.0	21.9	20.0	17.7	23.2	-	23.1	21.6	23.3
	Min	8.6	9.6	10.1	12.4	12.7	13.4	12.9	14.1	11.5	10.2	11.6	10.1	9.0
Relative Humidity	Max	89	95	97	100	86	81	92	100	82	99	92	99	-
	Min	22	19	43	52	33	46	63	70	48	-	44	46	-
Soil Temperature at 10 cm	06 UTC	19.6	19.8	19.8	-	-	-	-	-	-	-	19.7	16.2	17.3
	12 UTC	26.2	-	24.8	-	-	-	-	-	-	-	25.5	19.4	19.3
Sunshine Duration		10.3	9.6	7.9	4.7	10.1	4.3	0.5	0.1	9.8	1.4	5.9	6.3	7.4
Precipitation				2.9	29.7	0.0	0.0	3.8	5.5		0.0	41.9	18.7	9.7
Evaporation		5.4	5.2	-	-	-	-	-	-	-	-	-	-	32.6
Growing Degrees	5	13.6	13.2	12.3	13.3	11.9	12.7	11.5	10.9	12.4	-	-	108.6	111.8
	10	8.6	8.2	7.3	8.3	6.9	7.7	6.5	5.9	7.4	-	-	58.6	62.0

1st 10-day period (1-10/10/2019)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	-	20.6	25.4
Precipitation - Reference Evapotranspiration	-	-1.9	-15.7
Number of Rainy Days	4.0	5.0	2.0
Number of Dry Days	7.0	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





◆ **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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The present bulletin was designed and implemented under the support of Water Resources Management Division of Agriculture University of Athens