



AGROMETEOROLOGICAL BULLETIN

*January 2018
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



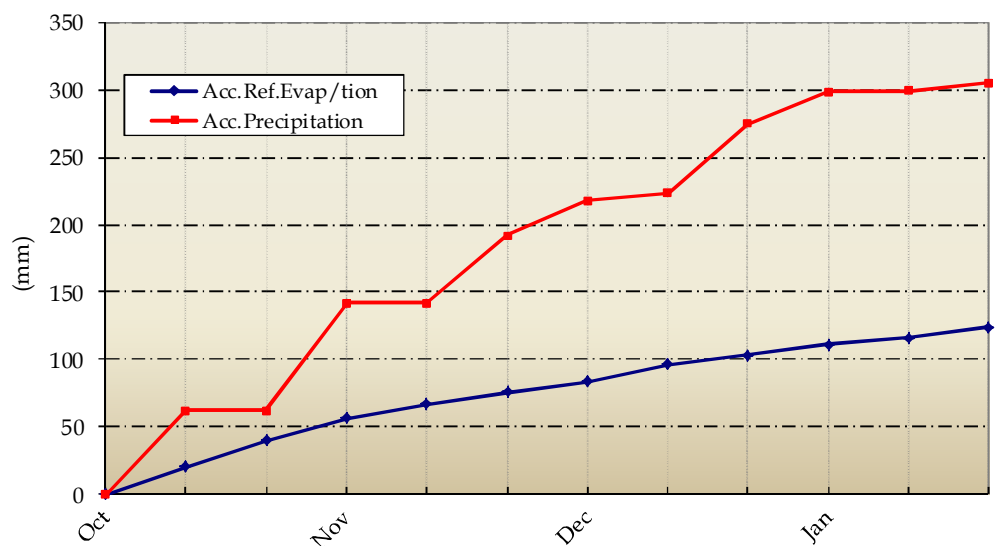
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www.emy.gr
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2nd 10-day period (11-20/01/2018)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	10.0	13.2	8.4	5.6	5.4	10.6	14.8	13.6	13.2	14.4	10.9	6.4	8.0
	Min	7.6	4.0	4.8	0.6	0.4	1.8	4.4	3.4	2.0	2.6	3.2	0.5	0.2
Relative Humidity	Max	95	97	94	89	95	94	97	92	97	97	95	92	-
	Min	87	81	78	66	74	80	77	41	38	63	68	72	-
Soil Temperature at 10 cm	06 UTC	8.2	7.2	7.6	5.4	4.0	5.6	6.4	8.4	4.0	6.4	6.3	3.4	4.2
	12 UTC	8.8	9.0	7.6	6.0	5.0	7.4	9.8	7.8	6.6	8.0	7.6	4.2	5.1
Sunshine Duration		0.0	4.8	0.0	5.0	0.0	5.0	8.1	1.3	8.6	3.1	3.6	1.3	3.1
Precipitation			0.0	0.0			0.0	0.2	5.5		0.2	5.9	61.2	11.4
Evaporation		0.2	2.3	1.4	2.0	1.2	0.8	0.3	0.2	2.6	1.6	12.6	4.4	6.6
Growing Degrees	5	3.8	3.6	1.6	0.0	0.0	1.2	4.6	3.5	2.6	3.5	24.4	6.9	9.4
	10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.9

2nd 10-day period (11-20/01/2018)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	7.8	6.8	8.8
Precipitation - Reference Evapotranspiration	-1.9	54.4	2.6
Number of Rainy Days	3.0	9.0	2.2
Number of Dry Days	12.0	3.0	-

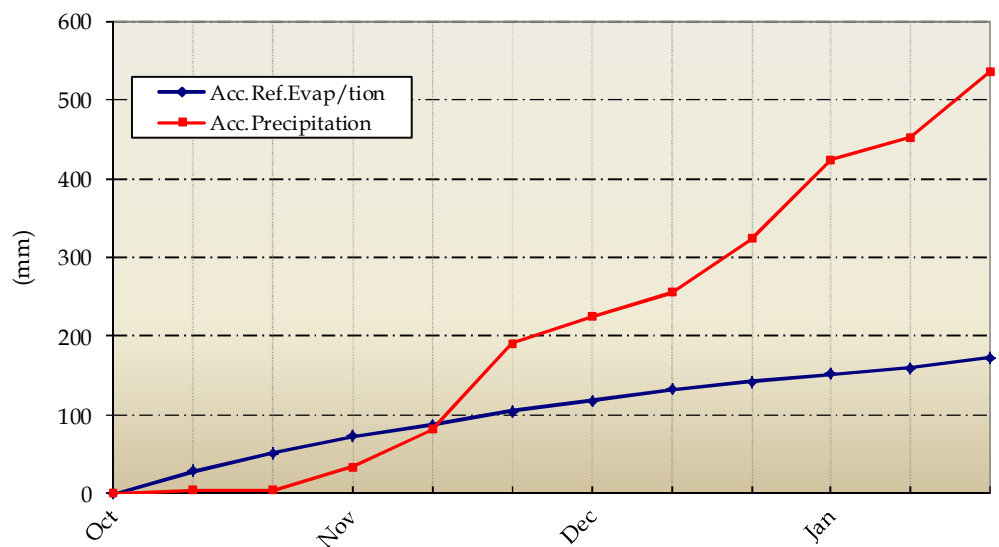
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



2nd 10-day period (11-20/01/2018)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	14.4	16.3	14.6	14.6	13.6	16.2	16.6	15.6	14.6	15.4	15.2	12.3	13.6
	Min	10.8	7.6	8.8	6.3	5.8	10.1	10.6	9.4	3.7	8.7	8.2	4.7	4.8
Relative Humidity	Max	89	91	87	87	91	89	90	72	86	87	87	90	-
	Min	73	57	58	44	70	53	56	26	49	66	55	60	-
Soil Temperature at 10 cm	06 UTC	12.4	11.6	11.4	10.5	10.8	11.4	12.0	11.4	9.0	10.6	11.1	8.3	8.3
	12 UTC	13.0	12.2	12.0	11.6	13.4	13.8	13.0	12.6	9.6	11.2	12.2	9.0	9.8
Sunshine Duration		0.6	2.6	2.3	7.4	1.8	5.4	2.4	7.7	2.1	0.0	3.2	2.5	4.4
Precipitation		6.0	9.0	15.4		41.0	3.9	5.6	2.4			83.3	131.6	33.0
Evaporation		0.0	0.2	2.0	1.8	0.1	0.6	5.4	2.0	1.0	1.0	14.1	18.0	18.1
Growing Degrees	5	7.6	7.0	6.7	5.5	4.7	8.2	8.6	7.5	4.2	7.1	66.9	35.2	42.4
	10	2.6	2.0	1.7	0.5	0.0	3.2	3.6	2.5	0.0	2.1	18.0	2.2	7.2

2nd 10-day period (11-20/01/2018)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	13.4	9.4	9.4
Precipitation - Reference Evapotranspiration	69.9	122.2	23.6
Number of Rainy Days	7.0	8.0	3.7
Number of Dry Days	6.0	0.0	-

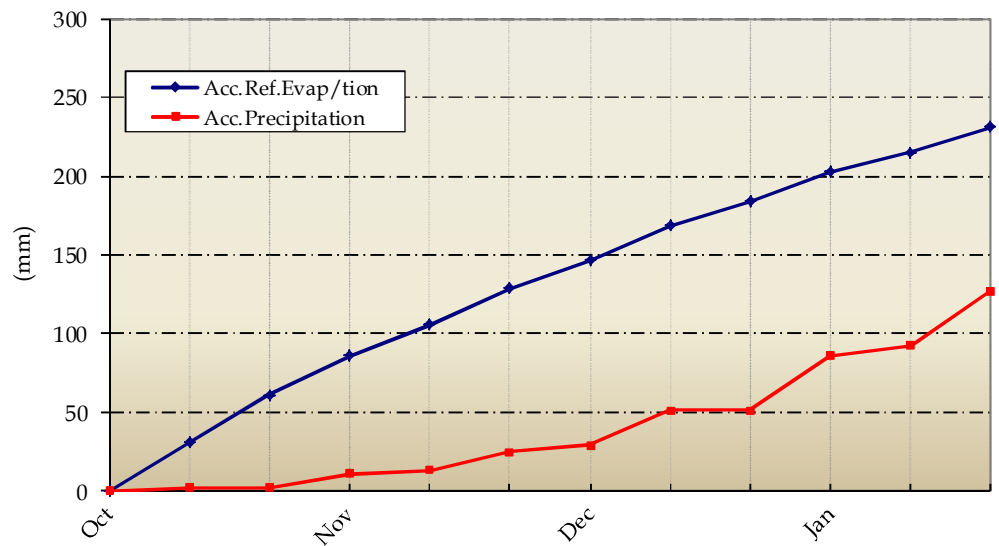
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



2nd 10-day period (11-20/01/2018)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	19.6	17.4	16.2	13.2	14.2	17.0	17.6	15.0	15.4	18.0	16.4	16.4	14.7
	Min	14.6	11.2	9.2	9.4	11.6	8.2	11.4	14.4	9.4	8.6	10.8	9.2	9.1
Relative Humidity	Max	88	87	97	94	88	91	87	80	86	86	88	85	-
	Min	70	65	66	73	66	65	65	58	58	57	64	52	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
Sunshine Duration		4.7	7.9	3.9	0.0	5.9	4.5	5.2	4.8	7.3	7.6	5.2	5.3	3.7
Precipitation		0.2		3.2	30.9				0.0			34.3	16.8	28.7
Evaporation		1.7	2.7	0.5	0.3	4.9	4.0	1.4	3.5	3.3	3.2	25.5	20.4	24.1
Growing Degrees	5	12.1	9.3	7.7	6.3	7.9	7.6	9.5	9.7	7.4	8.3	85.8	77.9	68.9
	10	7.1	4.3	2.7	1.3	2.9	2.6	4.5	4.7	2.4	3.3	35.8	28.8	21.0

2nd 10-day period (11-20/01/2018)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	15.7	17.1	-
Precipitation - Reference Evapotranspiration	18.6	-0.3	28.7
Number of Rainy Days	3.0	4.0	4.2
Number of Dry Days	5.0	4.0	-

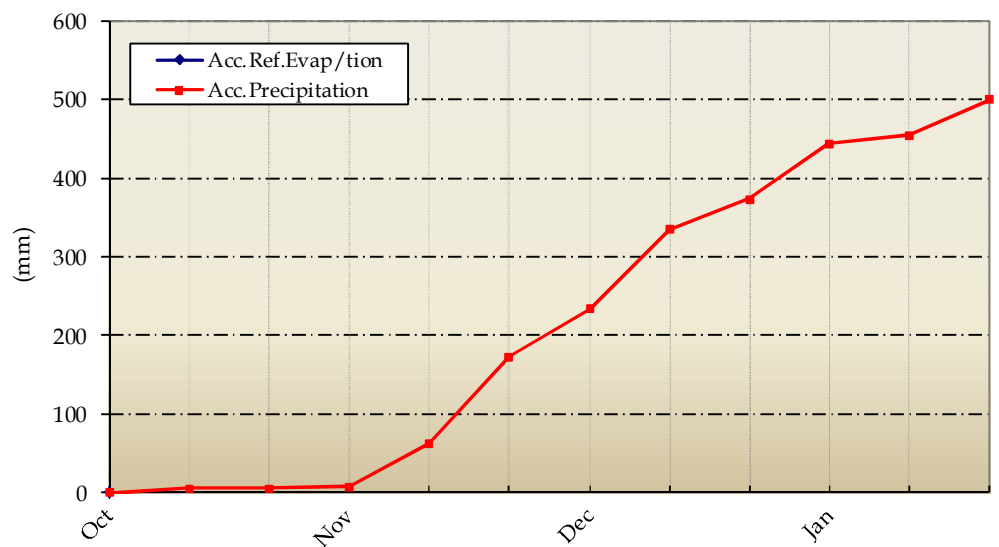
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



2nd 10-day period (11-20/01/2018)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	10.4	11.4	10.4	10.2	9.6	8.6	10.4	10.4	5.6	10.6	9.8	5.7	8.7
	Min	3.8	4.4	5.4	3.8	4.8	5.2	5.0	1.4	-4.0	4.0	3.4	-2.0	-0.4
Relative Humidity	Max	100	100	59	100	97	100	97	96	97	100	95	100	-
	Min	83	67	46	64	78	92	90	28	66	92	71	76	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	3.2
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	3.8
Sunshine Duration		0.0	2.0	0.2	0.3	0.6	0.1	0.0	6.6	0.5	0.0	1.0	1.5	3.0
Precipitation		0.5	1.1	0.9	0.0	5.1	8.2	12.8	7.3		8.5	44.4	68.3	26.9
Evaporation		-	-	-	-	-	-	-	-	-	-	-	-	4.4
Growing Degrees	5	2.1	2.9	2.9	2.0	2.2	1.9	2.7	0.9	0.0	2.3	19.9	0.6	9.3
	10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3

2nd 10-day period (11-20/01/2018)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	-	-	6.6
Precipitation - Reference Evapotranspiration	-	-	20.3
Number of Rainy Days	8.0	7.0	2.9
Number of Dry Days	6.0	0.0	-

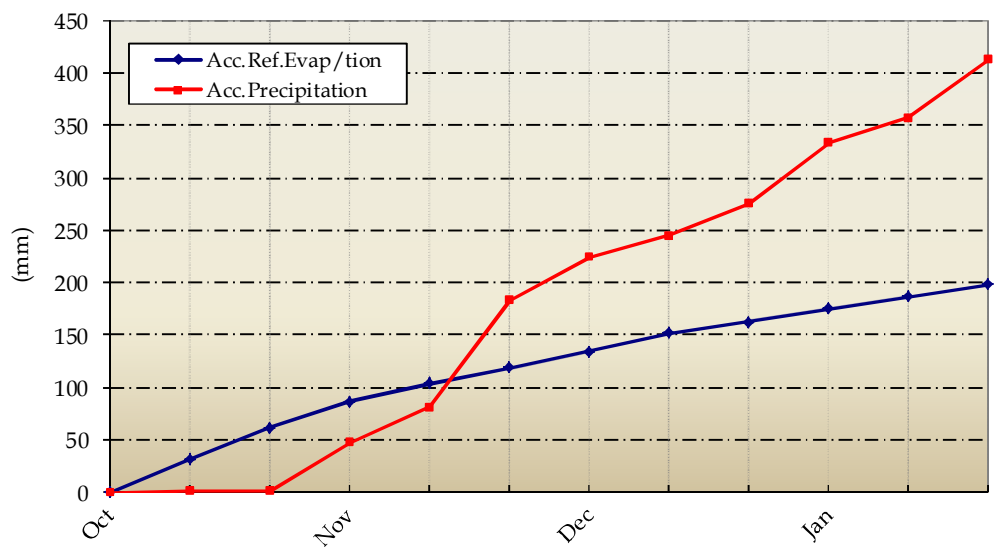
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



2nd 10-day period (11-20/01/2018)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	14.4	16.0	12.9	16.4	13.7	14.7	18.7	13.0	16.4	15.9	15.2	14.0	14.6
	Min	8.6	4.9	8.3	6.5	7.2	9.3	7.5	7.6	0.4	9.0	6.9	4.3	4.9
Relative Humidity	Max	94	94	92	89	92	93	93	81	85	92	90	92	-
	Min	77	61	58	42	67	73	60	22	43	62	56	54	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	9.0
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	10.1
Sunshine Duration		0.0	2.8	0.4	8.0	0.3	1.5	1.4	7.7	6.1	0.0	2.8	3.9	4.2
Precipitation		23.7	1.6	16.5	0.0	0.9	9.0	0.3	3.1			55.1	98.5	33.9
Evaporation		0.0	0.7	0.4	1.0	0.3	0.3	0.0	4.9	1.3	0.5	9.4	12.1	23.4
Growing Degrees	5	6.5	5.5	5.6	6.5	5.5	7.0	8.1	5.3	3.4	7.5	60.7	41.4	47.5
	10	1.5	0.5	0.6	1.5	0.5	2.0	3.1	0.3	0.0	2.5	12.3	1.1	8.1

2nd 10-day period (11-20/01/2018)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	11.1	11.5	11.1
Precipitation - Reference Evapotranspiration	44.0	87.0	22.8
Number of Rainy Days	7.0	8.0	3.8
Number of Dry Days	6.0	0.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

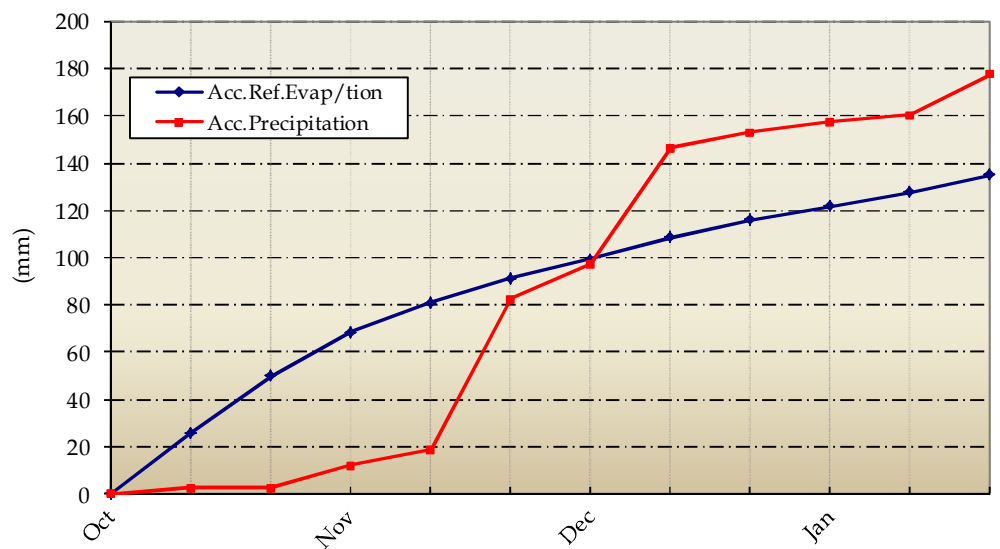


Larisa

2nd 10-day period (11-20/01/2018)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	12.0	12.2	10.2	7.8	9.0	12.6	15.4	12.8	14.4	15.8	12.2	1.9	9.3
	Min	6.6	7.2	6.0	4.4	4.8	3.0	0.2	5.2	-4.1	0.2	3.4	-5.9	0.0
Relative Humidity	Max	100	100	100	100	100	100	100	88	96	100	98	100	-
	Min	93	77	88	66	84	86	59	37	41	65	70	85	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	3.2	5.0
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	3.6	5.5
Sunshine Duration		0.3	0.7	0.0	0.0	0.0	5.3	5.2	7.7	7.6	3.1	3.0	1.2	3.6
Precipitation			1.0	15.8	0.0	0.3						17.1	51.5	8.6
Evaporation		0.2	0.6	8.0	0.1	0.0	1.1	0.4	1.0	0.8	6.2	18.4	1.2	5.9
Growing Degrees	5	4.3	4.7	3.1	1.1	1.9	2.8	2.8	4.0	0.2	3.0	27.9	0.7	9.7
	10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4

2nd 10-day period (11-20/01/2018)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	7.6	3.6	6.4
Precipitation - Reference Evapotranspiration	9.5	47.9	2.2
Number of Rainy Days	3.0	6.0	2.6
Number of Dry Days	7.0	0.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

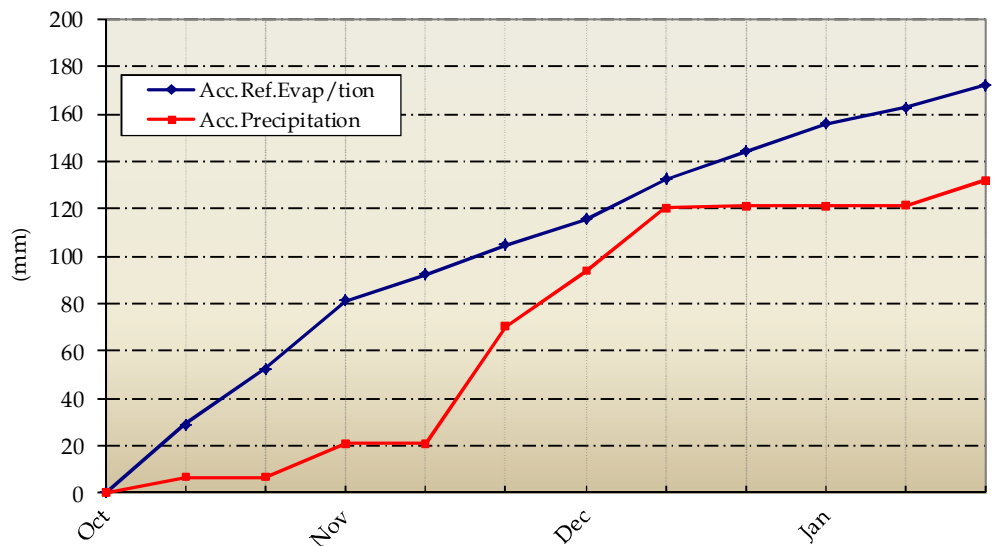


Mikra

2nd 10-day period (11-20/01/2018)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	11.2	9.7	9.8	8.6	6.6	8.6	15.2	10.2	11.5	11.9	10.3	6.0	8.8
	Min	6.5	6.4	7.5	5.3	4.8	5.6	1.5	3.0	-1.4	0.2	3.9	-1.1	1.1
Relative Humidity	Max	93	92	81	87	90	93	94	88	71	79	87	96	-
	Min	78	69	53	45	72	48	52	32	35	55	54	66	-
Soil Temperature at 10 cm	06 UTC	9.1	9.0	8.8	8.0	7.2	7.6	7.0	7.4	5.1	5.2	7.4	2.3	4.3
	12 UTC	9.4	9.4	9.0	8.2	7.6	8.2	8.0	7.5	6.2	6.4	8.0	2.9	5.7
Sunshine Duration		1.2	0.0	0.0	0.0	0.0	2.1	4.8	8.2	8.5	4.0	2.9	2.0	3.6
Precipitation		0.5	3.2	3.1	0.0	1.9	0.0		2.0			10.7	40.1	6.6
Evaporation		0.6	0.1	0.7	0.5	0.6	2.5	2.5	3.3	2.7	1.5	15.0	4.9	10.5
Growing Degrees	5	3.9	3.1	3.7	2.0	0.7	2.1	3.4	1.6	0.1	1.1	21.4	3.2	11.4
	10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9

2nd 10-day period (11-20/01/2018)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	9.5	5.7	8.8
Precipitation - Reference Evapotranspiration	1.2	34.4	-2.2
Number of Rainy Days	5.0	5.0	2.2
Number of Dry Days	6.0	4.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

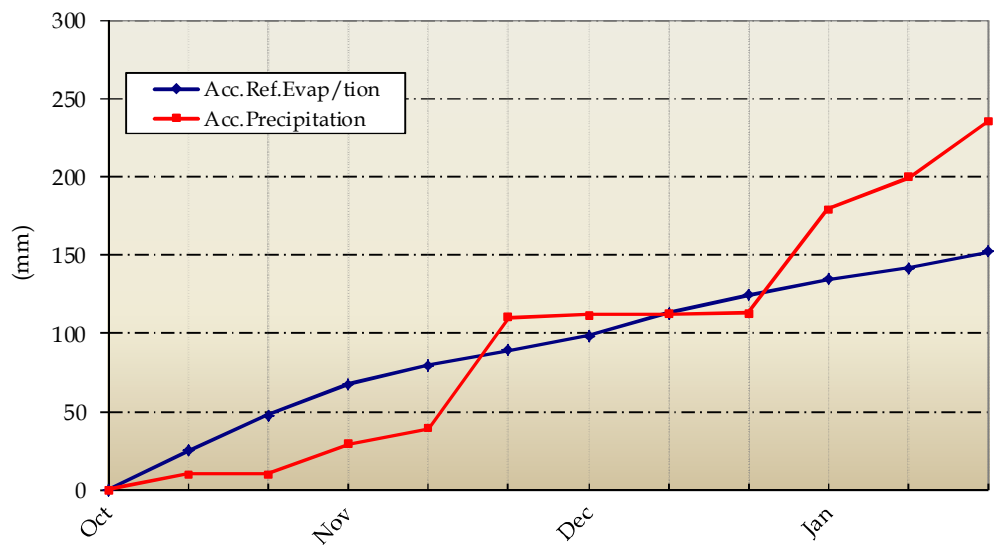


Tanagra

2nd 10-day period (11-20/01/2018)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	12.9	13.5	11.2	8.5	11.0	15.7	15.3	9.8	15.8	17.6	13.1	10.5	11.4
	Min	6.2	8.6	7.6	6.7	0.2	6.3	7.2	0.8	-3.4	6.2	4.6	1.8	3.0
Relative Humidity	Max	100	100	100	99	100	100	78	69	82	84	91	97	-
	Min	79	69	77	67	62	50	39	25	35	44	55	62	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
Sunshine Duration		0.1	4.7	0.0	0.9	1.7	6.2	6.1	7.1	8.0	3.0	3.8	3.8	
Precipitation		1.8	2.4	23.6	8.2							36.0	27.4	26.0
Evaporation		-	-	-	-	-	-	-	-	-	-	-	-	-
Growing Degrees	5	4.6	6.1	4.4	2.6	0.6	6.0	6.3	0.3	1.2	6.9	38.9	19.7	
	10	0.0	1.1	0.0	0.0	0.0	1.0	1.3	0.0	0.0	1.9	5.2	0.0	

2nd 10-day period (11-20/01/2018)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	10.2	7.4	
Precipitation - Reference Evapotranspiration	25.8	20.0	26.0
Number of Rainy Days	4.0	6.0	4.7
Number of Dry Days	6.0	3.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

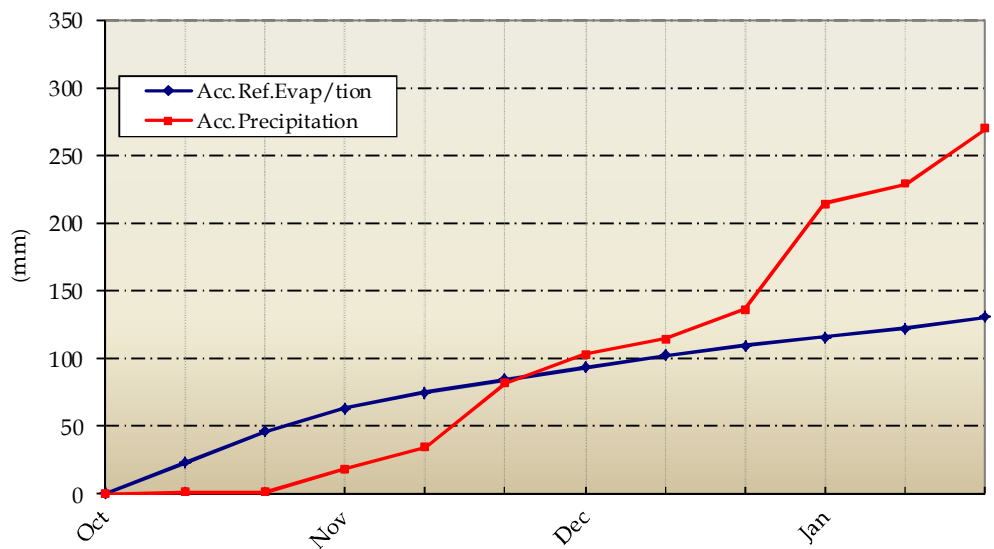


Tripoli

2nd 10-day period (11-20/01/2018)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	9.4	11.3	8.6	8.0	6.5	12.0	11.0	10.2	11.8	10.7	10.0	8.4	9.4
	Min	4.6	2.1	4.7	3.4	2.1	5.7	6.8	1.7	-3.9	7.0	3.4	0.0	0.1
Relative Humidity	Max	100	100	100	100	100	100	95	89	87	97	97	100	-
	Min	75	55	71	59	93	52	66	19	40	70	60	64	-
Soil Temperature at 10 cm	06 UTC	7.4	6.4	7.4	6.4	6.2	6.2	7.2	6.8	3.2	6.4	6.4	3.2	4.3
	12 UTC	8.2	8.2	-	-	6.4	8.2	7.8	7.0	5.0	-	7.3	4.4	5.0
Sunshine Duration		0.0	3.2	0.0	3.2	0.0	6.2	1.6	7.2	5.8	0.2	2.7	3.1	4.1
Precipitation		10.5	1.7	11.5	0.1	1.2	8.3	0.8	6.8			40.9	99.6	31.6
Evaporation		0.6	1.0	1.2	1.0	0.1	1.2	1.0	0.0	0.0	2.0	8.1	2.9	5.6
Growing Degrees	5	2.0	1.7	1.7	0.7	0.0	3.9	3.9	1.0	0.0	3.9	18.6	4.2	10.8
	10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5

2nd 10-day period (11-20/01/2018)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	8.2	6.5	8.5
Precipitation - Reference Evapotranspiration	32.7	93.1	23.1
Number of Rainy Days	8.0	8.0	3.7
Number of Dry Days	6.0	0.0	-

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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