



AGROMETEOROLOGICAL BULLETIN

December 2017
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



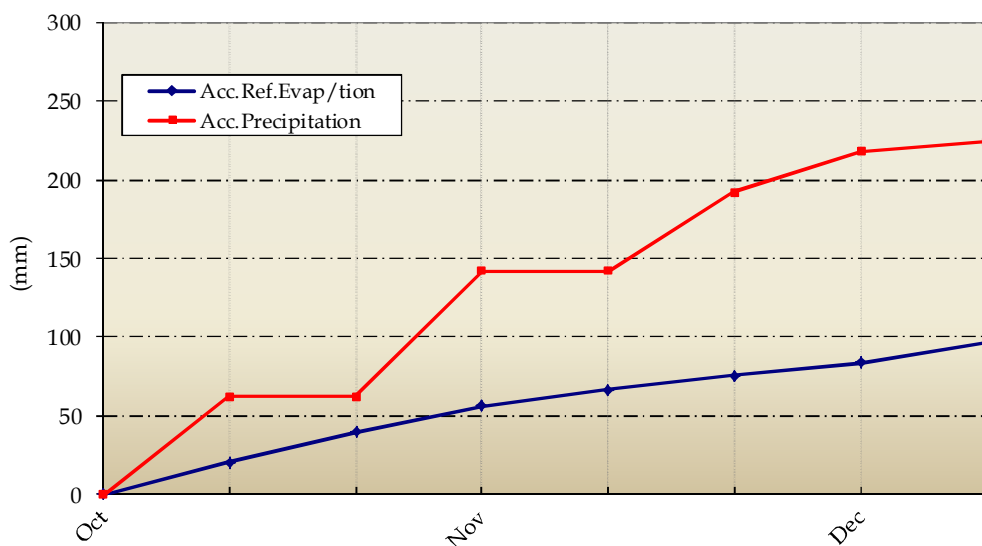
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Web adresses of HNMS
www.emy.gr
www.hnms.gr
www.emy.gov.gr
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1st 10-day period (1-10/12/2017)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	18.8	19.4	19.6	17.8	11.6	10.4	14.0	15.4	16.6	16.0	16.0	10.3	11.0
	Min	16.6	15.2	16.6	10.0	4.0	-1.0	-0.6	5.8	7.4	5.4	7.9	-2.1	3.3
Relative Humidity	Max	90	96	90	88	74	89	93	91	91	93	90	81	-
	Min	70	69	74	50	48	40	61	61	66	40	58	43	-
Soil Temperature at 10 cm	06 UTC	13.0	14.0	14.0	13.2	10.4	7.0	6.4	8.0	10.2	12.0	10.8	3.5	7.1
	12 UTC	13.8	14.6	15.4	14.6	11.0	8.6	8.8	10.0	12.0	12.2	12.1	7.0	8.4
Sunshine Duration		0.0	2.3	5.4	7.2	6.2	6.2	6.6	8.3	7.8	7.8	5.8	7.0	2.7
Precipitation											6.0	6.0		30.2
Evaporation		5.0	1.1	1.5	3.4	1.4	0.0	0.0	1.4	1.6	1.4	16.8	0.6	14.9
Growing Degrees	5	12.7	12.3	13.1	8.9	2.8	0.0	1.7	5.6	7.0	5.7	69.8	5.4	28.2
	10	7.7	7.3	8.1	3.9	0.0	0.0	0.0	0.6	2.0	0.7	30.3	0.0	5.3

1st 10-day period (1-10/12/2017)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	12.5	6.8	9.7
Precipitation - Reference Evapotranspiration	-6.5	-6.8	20.5
Number of Rainy Days	1.0	0.0	3.2
Number of Dry Days	9.0	11.0	-

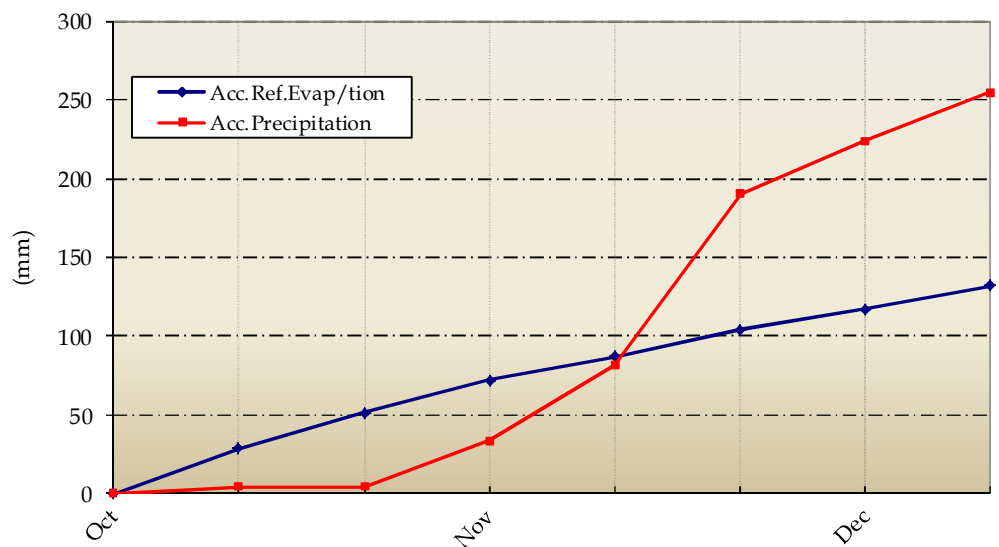
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



1st 10-day period (1-10/12/2017)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	20.5	20.4	19.0	15.4	14.2	12.6	14.7	17.0	17.6	15.2	16.7	15.8	15.9
	Min	18.6	16.6	11.7	9.0	5.4	2.1	2.4	5.8	7.8	7.7	8.7	7.2	7.3
Relative Humidity	Max	75	89	88	88	90	73	85	86	88	88	85	90	-
	Min	60	64	43	56	31	29	49	57	50	41	48	58	-
Soil Temperature at 10 cm	06 UTC	14.2	15.4	16.0	14.2	11.8	10.4	9.8	10.5	11.4	12.5	12.6	-	10.4
	12 UTC	15.4	16.5	16.2	14.4	13.8	12.0	11.4	12.1	12.0	13.0	13.7	-	12.0
Sunshine Duration		0.0	0.0	5.0	2.5	6.2	7.2	6.6	6.3	5.4	6.4	4.6	4.2	4.3
Precipitation			13.1	4.0	3.4	0.1				0.7	9.3	30.6	31.4	41.8
Evaporation		2.7	0.2	6.3	0.8	3.0	1.0	2.0	1.0	2.1	1.0	20.1	22.3	19.4
Growing Degrees	5	14.6	13.5	10.4	7.2	4.8	2.4	3.6	6.4	7.7	6.5	76.9	64.9	66.0
	10	9.6	8.5	5.4	2.2	0.0	0.0	0.0	1.4	2.7	1.5	31.2	18.3	20.7

1st 10-day period (1-10/12/2017)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	15.0	7.8	9.1
Precipitation - Reference Evapotranspiration	15.6	23.6	32.7
Number of Rainy Days	6.0	3.0	4.6
Number of Dry Days	1.0	3.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

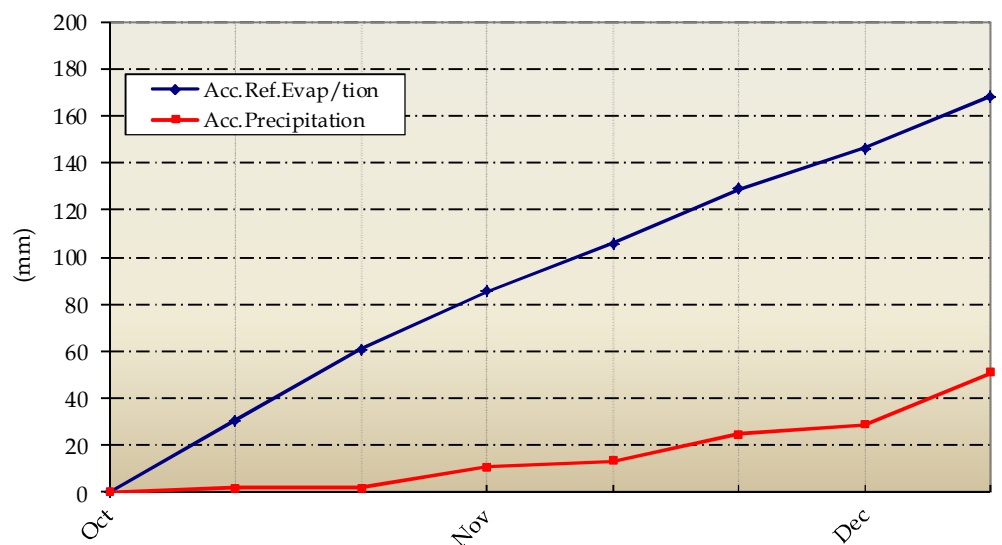


Iraklio

1st 10-day period (1-10/12/2017)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	22.4	21.8	23.4	20.4	16.0	11.4	15.2	17.2	19.0	20.0	18.7	16.2	17.3
	Min	17.0	17.0	18.4	14.8	13.8	9.6	9.6	7.4	10.0	13.8	13.1	10.7	11.5
Relative Humidity	Max	70	72	74	82	90	79	72	80	79	85	78	84	-
	Min	45	51	49	65	58	52	56	51	54	60	54	57	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
Sunshine Duration		5.7	3.8	7.0	7.2	2.8	1.6	7.9	7.9	7.6	3.8	5.5	4.0	3.5
Precipitation						12.8	9.4					22.2	16.9	24.2
Evaporation		3.8	5.7	3.2	3.9	1.3	3.0	0.9	2.4	2.1	1.6	27.9	21.0	28.3
Growing Degrees	5	14.7	14.4	15.9	12.6	9.9	5.5	7.4	7.3	9.5	11.9	109.1	84.9	94.2
	10	9.7	9.4	10.9	7.6	4.9	0.5	2.4	2.3	4.5	6.9	59.1	34.9	44.6

1st 10-day period (1-10/12/2017)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	22.1	15.6	-
Precipitation - Reference Evapotranspiration	0.1	1.3	24.2
Number of Rainy Days	2.0	2.0	3.7
Number of Dry Days	6.0	0.0	-

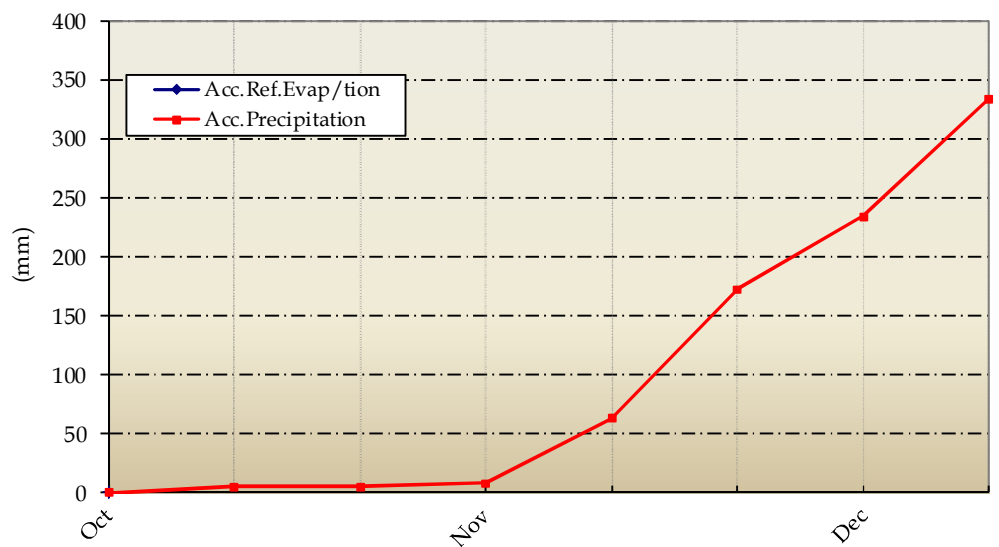
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



1st 10-day period (1-10/12/2017)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	15.2	15.2	12.6	11.8	9.8	10.6	10.2	9.6	10.2	10.4	11.6	12.5	10.3
	Min	11.8	10.4	8.6	5.6	1.6	-3.2	-4.2	-3.8	3.0	2.0	3.2	0.1	1.9
Relative Humidity	Max	100	98	100	97	97	96	96	100	100	100	98	100	-
	Min	85	83	54	64	36	39	48	62	84	55	61	59	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	5.5
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	6.5
Sunshine Duration		0.0	0.0	1.8	3.3	3.9	6.3	5.3	3.6	2.0	4.6	3.1	2.8	2.5
Precipitation		29.6	28.8	7.3	4.6					17.0	13.2	100.5	2.5	51.5
Evaporation		-	-	-	-	-	-	-	-	-	-	-	-	10.5
Growing Degrees	5	8.5	7.8	5.6	3.7	0.7	0.0	0.0	0.0	1.6	1.2	29.1	-	17.8
	10	3.5	2.8	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.9	-	0.9

1st 10-day period (1-10/12/2017)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	-	-	6.1
Precipitation - Reference Evapotranspiration	-	-	45.4
Number of Rainy Days	6.0	3.0	4.2
Number of Dry Days	0.0	2.0	-

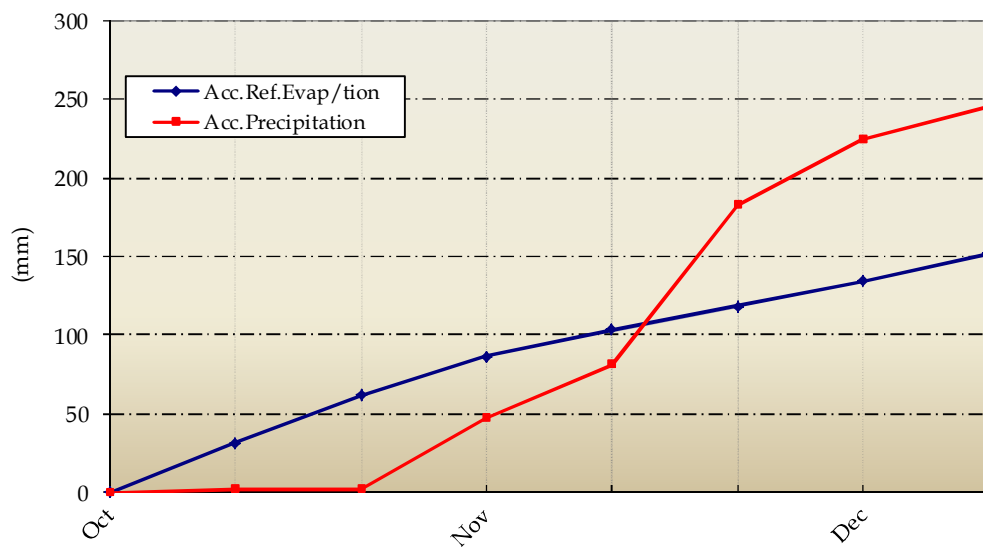
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



1st 10-day period (1-10/12/2017)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	20.2	19.6	20.6	19.2	15.9	14.2	17.9	17.7	17.8	15.5	17.9	16.8	16.9
	Min	18.3	17.9	15.9	6.8	4.5	3.1	1.3	1.7	4.5	9.0	8.3	6.6	7.2
Relative Humidity	Max	71	79	87	92	92	82	89	91	92	92	87	92	-
	Min	63	64	48	50	35	22	34	46	52	43	46	52	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	11.5
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	12.5
Sunshine Duration		1.5	0.0	4.6	4.8	8.2	8.3	8.2	8.0	5.5	5.7	5.5	5.1	4.0
Precipitation		0.0	0.2	1.0	0.1	0.1				2.4	16.7	20.5	2.5	45.8
Evaporation		3.1	1.5	1.6	2.9	2.2	0.4	2.6	0.4	1.1	9.0	24.8	11.0	26.7
Growing Degrees	5	14.3	13.8	13.3	8.0	5.2	3.7	4.6	4.7	6.2	7.3	80.8	67.2	70.4
	10	9.3	8.8	8.3	3.0	0.2	0.0	0.0	0.0	1.2	2.3	32.9	19.8	22.7

1st 10-day period (1-10/12/2017)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	17.7	10.5	10.9
Precipitation - Reference Evapotranspiration	2.8	-8.0	34.9
Number of Rainy Days	6.0	3.0	4.7
Number of Dry Days	1.0	2.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

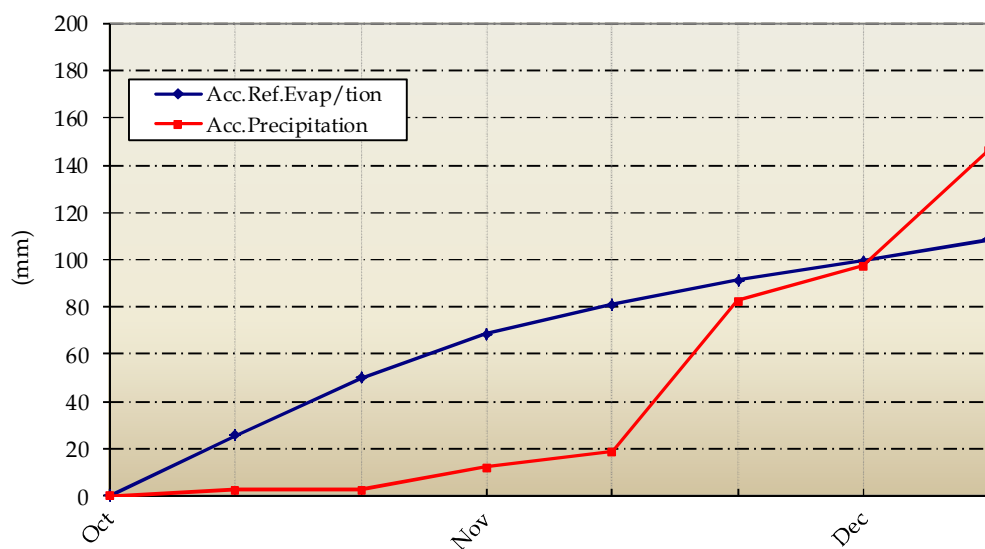


Larisa

1st 10-day period (1-10/12/2017)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	19.2	15.4	19.6	15.2	11.0	13.0	13.0	14.0	16.0	14.0	15.0	11.0	11.5
	Min	13.6	11.0	3.6	3.4	1.8	-3.5	-2.2	-2.0	-1.2	4.4	2.9	1.4	2.7
Relative Humidity	Max	96	100	100	100	98	97	96	96	96	97	98	99	-
	Min	54	92	46	52	52	34	44	39	41	28	48	57	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	10.1	8.1
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	10.2	8.8
Sunshine Duration		0.2	0.0	6.4	4.3	6.7	7.3	7.2	7.3	4.9	7.2	5.2	2.9	2.9
Precipitation		6.1	37.4	4.3							1.3	49.1	1.4	18.5
Evaporation		-	0.0	5.0	0.5	0.6	1.7	2.1	1.6	0.6	1.2	-	5.3	7.8
Growing Degrees	5	11.4	8.2	6.6	4.3	1.4	0.0	0.4	1.0	2.4	4.2	39.9	16.8	25.6
	10	6.4	3.2	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.2	0.0	2.3

1st 10-day period (1-10/12/2017)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	9.1	5.5	6.7
Precipitation - Reference Evapotranspiration	40.0	-4.1	11.8
Number of Rainy Days	4.0	2.0	3.6
Number of Dry Days	3.0	3.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

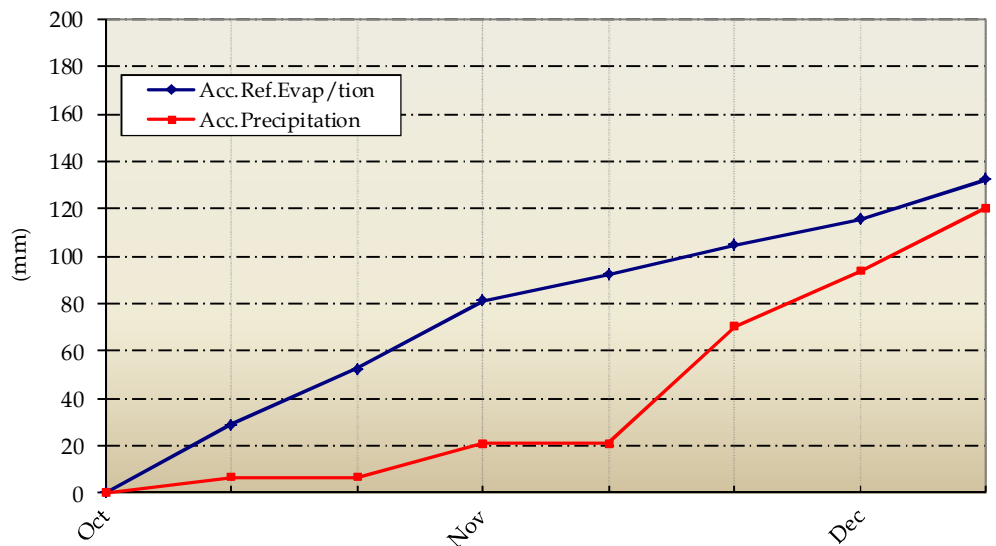


Mikra

1st 10-day period (1-10/12/2017)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	19.6	18.4	20.5	14.6	11.6	11.6	15.8	13.2	16.3	14.7	15.6	12.0	11.5
	Min	9.8	13.2	10.8	7.0	5.7	2.2	5.4	0.5	2.4	3.4	6.0	2.4	3.4
Relative Humidity	Max	63	93	93	70	52	70	71	90	92	86	78	87	-
	Min	46	72	39	40	40	40	34	51	36	28	43	43	-
Soil Temperature at 10 cm	06 UTC	11.0	12.6	12.8	11.2	9.0	7.2	7.4	7.0	7.0	9.1	9.4	6.7	7.3
	12 UTC	12.0	13.2	20.0	12.2	9.0	7.9	10.4	7.8	8.0	9.0	11.0	8.3	8.9
Sunshine Duration		0.0	0.0	8.4	3.6	7.6	7.7	7.8	9.1	6.8	8.1	5.9	5.4	3.1
Precipitation		0.1	26.2	0.1	0.0						0.2	26.6	0.9	19.0
Evaporation		1.9	5.5	1.0	1.9	4.4	4.3	4.8	1.8	1.2	3.0	29.8	26.3	13.0
Growing Degrees	5	9.7	10.8	10.7	5.8	3.7	1.9	5.6	1.9	4.4	4.1	58.4	22.0	28.1
	10	4.7	5.8	5.7	0.8	0.0	0.0	0.6	0.0	0.0	0.0	17.6	0.0	3.2

1st 10-day period (1-10/12/2017)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	16.8	9.4	8.7
Precipitation - Reference Evapotranspiration	9.8	-8.5	10.3
Number of Rainy Days	4.0	1.0	3.0
Number of Dry Days	3.0	3.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

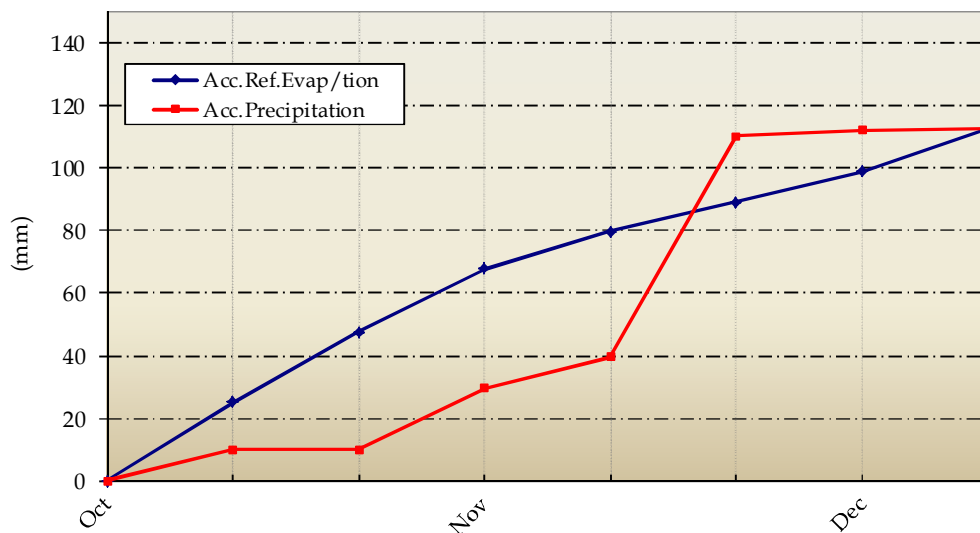


Tanagra

1st 10-day period (1-10/12/2017)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	19.4	20.6	21.2	17.4	10.6	10.1	16.6	17.6	16.9	15.6	16.6	13.6	14.0
	Min	17.4	16.9	17.8	5.8	4.4	4.4	-1.2	0.7	8.1	12.7	8.7	4.3	5.7
Relative Humidity	Max	68	66	73	95	80	74	84	100	66	71	78	95	-
	Min	54	47	40	45	44	38	22	36	38	26	39	43	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
Sunshine Duration		0.8	0.0	6.4	3.5	2.6	6.5	7.7	7.2	7.7	6.9	4.9	4.2	
Precipitation					0.2						0.0	0.2	2.8	28.6
Evaporation		-	-	-	-	-	-	-	-	-	-	-	-	-
Growing Degrees	5	13.4	13.8	14.5	6.6	2.5	2.3	2.7	4.2	7.5	9.2	76.5	39.5	
	10	8.4	8.8	9.5	1.6	0.0	0.0	0.0	0.0	2.5	4.2	34.9	2.0	

1st 10-day period (1-10/12/2017)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	14.0	8.1	
Precipitation - Reference Evapotranspiration	-13.8	-5.3	28.6
Number of Rainy Days	1.0	4.0	4.4
Number of Dry Days	5.0	0.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

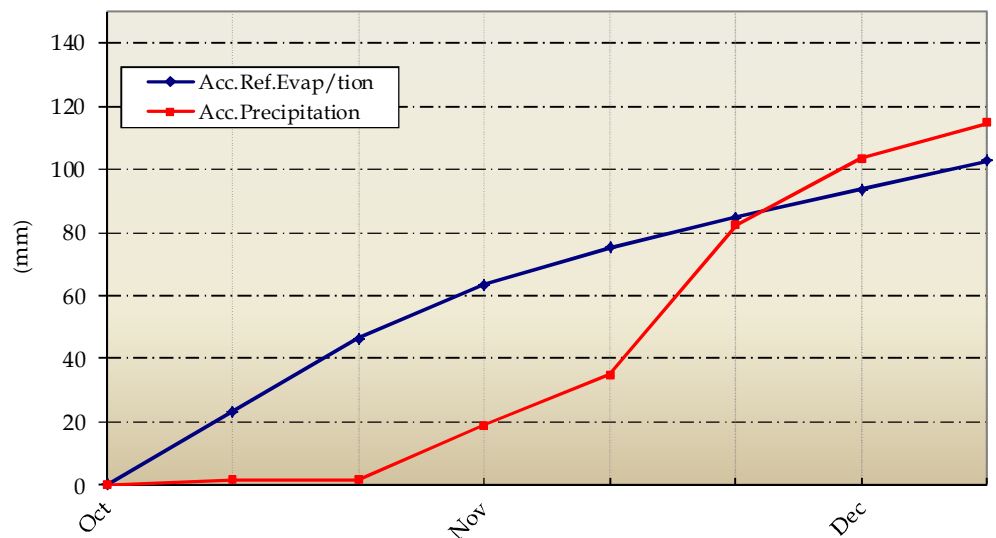


Tripoli

1st 10-day period (1-10/12/2017)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	16.5	17.0	15.2	14.0	11.2	9.1	15.5	15.6	11.4	10.5	13.6	11.5	11.6
	Min	11.8	9.7	10.1	5.0	-0.1	-1.6	-4.3	-4.4	1.5	3.1	3.1	0.9	2.8
Relative Humidity	Max	91	87	91	92	97	93	97	97	96	94	94	100	-
	Min	56	64	54	50	29	27	20	23	70	48	44	63	-
Soil Temperature at 10 cm	06 UTC	10.0	10.4	11.6	9.2	7.6	6.2	4.2	4.0	5.2	7.4	7.6	6.7	7.1
	12 UTC	11.2	-	-	11.2	9.0	7.0	6.2	5.8	-	-	8.4	8.1	7.9
Sunshine Duration		1.5	1.6	7.1	4.3	6.5	7.5	7.2	6.1	2.6	4.6	4.9	3.5	3.7
Precipitation			0.0	0.3	0.9					3.7	6.5	11.4	7.4	38.8
Evaporation		0.9	0.5	1.2	0.6	0.0	0.0	0.0	0.0	0.1	0.0	3.3	-	9.1
Growing Degrees	5	9.2	8.4	7.7	4.5	0.6	0.0	0.6	0.6	1.5	1.8	34.7	15.0	26.1
	10	4.2	3.4	2.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.2	0.0	2.6

1st 10-day period (1-10/12/2017)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	9.1	6.6	8.4
Precipitation - Reference Evapotranspiration	2.3	0.8	30.4
Number of Rainy Days	4.0	5.0	4.3
Number of Dry Days	2.0	2.0	-

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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