



AGROMETEOROLOGICAL BULLETIN

December 2016
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



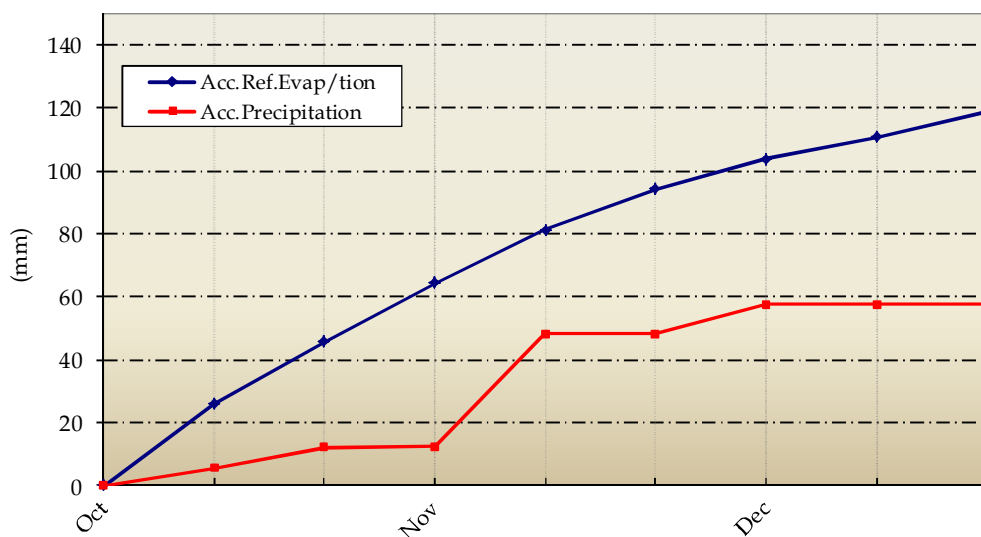
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2nd 10-day period (11-20/12/2016)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	15.0	15.6	12.0	5.2	9.4	5.2	6.2	6.6	7.8	8.4	9.1	10.7	10.6
	Min	1.0	4.8	-0.6	-8.0	-0.2	-4.0	-3.0	-7.0	-7.2	-6.0	-3.0	0.9	3.1
Relative Humidity	Max	94	95	85	79	71	75	67	81	90	90	83	85	-
	Min	68	39	54	25	54	39	27	37	40	42	42	47	-
Soil Temperature at 10 cm	06 UTC	5.0	7.2	7.1	2.4	4.0	2.8	2.0	1.2	1.0	1.2	3.4	5.2	6.3
	12 UTC	8.8	10.4	8.2	4.6	6.2	6.4	4.6	3.2	3.0	3.0	5.8	7.2	7.5
Sunshine Duration		6.8	1.7	1.0	8.4	0.2	7.7	8.3	6.0	8.2	6.4	5.5	5.2	2.5
Precipitation				0.0		0.0						0.0	0.1	23.7
Evaporation		0.9	2.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.6	6.7	11.7
Growing Degrees	5	3.0	5.2	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.9	11.3	26.7
	10	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	5.3

2nd 10-day period (11-20/12/2016)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	8.0	8.0	8.1
Precipitation - Reference Evapotranspiration	-8.0	-7.9	15.6
Number of Rainy Days	0.0	1.0	2.9
Number of Dry Days	21.0	0.0	-

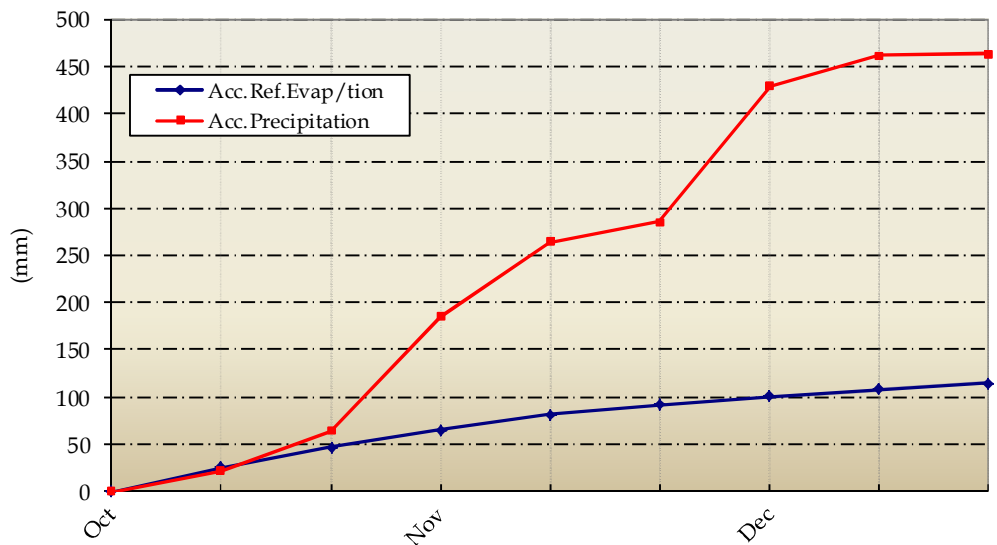
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



2nd 10-day period (11-20/12/2016)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	16.8	17.7	14.4	12.4	14.0	14.2	11.6	11.4	14.8	11.5	13.9	15.4	15.1
	Min	7.4	9.3	6.0	-0.4	2.0	1.0	0.6	-2.8	-0.5	1.3	2.4	3.8	6.8
Relative Humidity	Max	88	90	91	89	87	91	89	89	86	89	89	88	-
	Min	60	53	31	34	43	43	33	36	29	60	42	43	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	9.7
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	11.2
Sunshine Duration		1.6	3.6	7.9	7.0	6.3	6.0	6.7	6.8	7.0	0.0	5.3	6.0	4.1
Precipitation				2.4								2.4		43.9
Evaporation		1.5	4.0	2.0	2.0	4.0	2.0	1.0	3.0	1.0	3.0	23.5	13.0	19.6
Growing Degrees	5	7.1	8.5	5.2	1.0	3.0	2.6	1.1	0.0	2.2	1.4	32.1	46.1	59.8
	10	2.1	3.5	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.8	4.6	16.6

2nd 10-day period (11-20/12/2016)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	6.4	8.1	9.0
Precipitation - Reference Evapotranspiration	-4.0	-8.1	34.9
Number of Rainy Days	1.0	0.0	4.7
Number of Dry Days	6.0	22.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

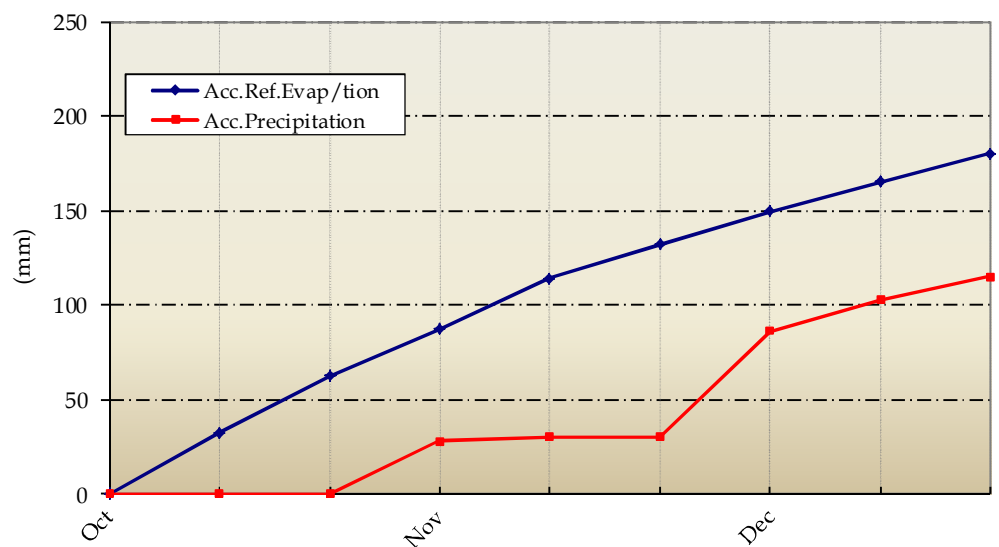


Iraklio

2nd 10-day period (11-20/12/2016)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	17.8	19.6	14.4	10.0	14.4	12.4	10.2	11.2	13.4	13.8	13.7	15.4	16.6
	Min	8.4	11.6	12.2	9.0	5.0	8.6	9.8	9.6	8.4	6.8	8.9	12.5	10.5
Relative Humidity	Max	87	85	91	74	83	83	71	72	80	85	81	79	-
	Min	67	56	58	50	58	55	56	51	51	65	57	60	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
Sunshine Duration		8.0	2.8	0.0	1.1	8.0	0.1	0.0	2.1	7.0	2.9	3.2	1.4	3.8
Precipitation			0.2	11.2			0.3	0.3				12.0	5.3	23.4
Evaporation		0.9	1.8	2.1	2.4	0.2	2.3	2.0	2.3	2.2	2.6	18.8	24.7	25.9
Growing Degrees	5	8.1	10.6	8.3	4.5	4.7	5.5	5.0	5.4	5.9	5.3	63.3	89.7	85.7
	10	3.1	5.6	3.3	0.0	0.0	0.5	0.0	0.4	0.9	0.3	14.1	39.7	36.5

2nd 10-day period (11-20/12/2016)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	15.3	16.5	-
Precipitation - Reference Evapotranspiration	-3.3	-11.2	23.4
Number of Rainy Days	4.0	2.0	3.8
Number of Dry Days	6.0	10.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

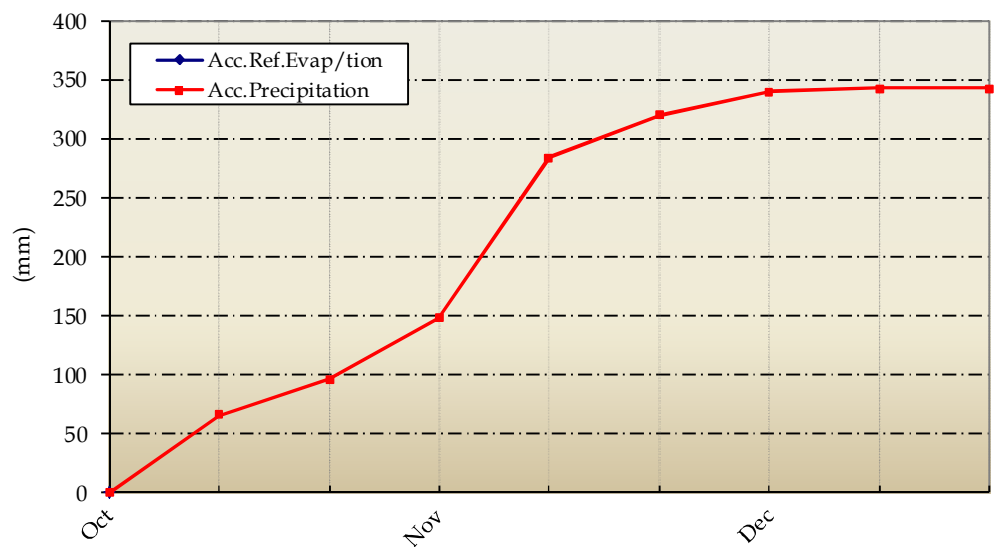


Ioannina

2nd 10-day period (11-20/12/2016)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	13.4	8.6	10.9	9.3	11.0	8.2	9.0	8.8	8.8	10.3	9.8	10.3	9.6
	Min	-	-0.4	-0.4	-7.4	-6.1	-4.1	-1.9	-8.6	-9.3	-6.9	-5.0	-2.9	1.6
Relative Humidity	Max	100	100	100	100	100	100	-	97	100	99	100	100	-
	Min	53	87	10	21	41	32	16	32	30	35	36	47	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	4.9
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	5.7
Sunshine Duration		2.3	0.8	6.3	6.5	-	6.2	-	5.3	5.4	4.2	4.6	3.5	2.5
Precipitation												0.0	2.5	54.5
Evaporation		-	-	-	-	-	-	-	-	-	-	-	-	5.5
Growing Degrees	5	-	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	3.7	16.0
	10	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	0.0	0.8

2nd 10-day period (11-20/12/2016)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	-	-	5.7
Precipitation - Reference Evapotranspiration	-	-	48.8
Number of Rainy Days	0.0	1.0	4.4
Number of Dry Days	14.0	19.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

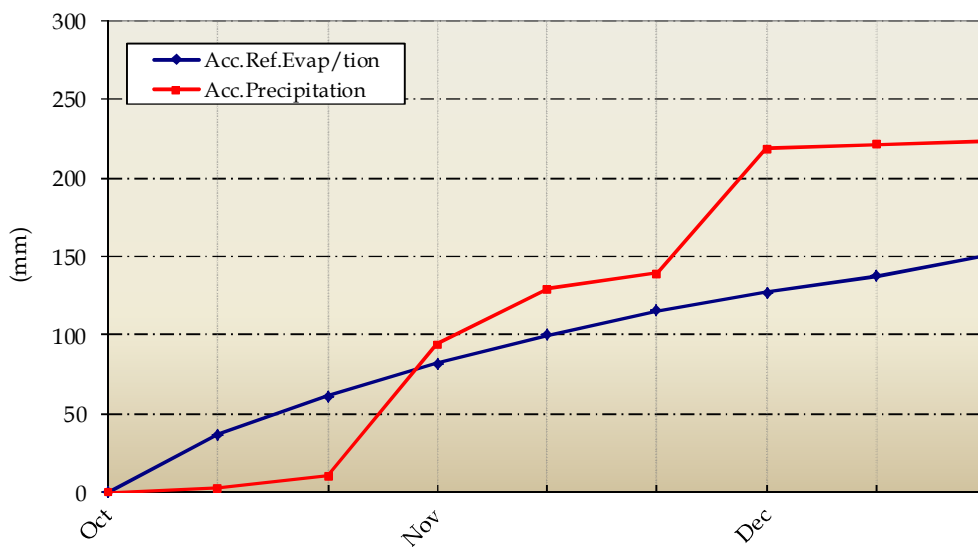


Kalamata

2nd 10-day period (11-20/12/2016)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	19.2	18.4	16.6	15.7	17.0	12.9	11.1	15.5	14.8	12.5	15.4	16.4	15.9
	Min	4.2	6.9	7.6	4.4	0.3	4.4	6.5	0.6	-0.3	1.0	3.6	5.1	6.6
Relative Humidity	Max	93	94	94	86	89	87	66	90	90	86	88	86	-
	Min	43	52	32	29	42	43	32	28	24	51	38	45	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	11.3	10.6
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	11.8	11.5
Sunshine Duration		7.7	6.5	7.8	8.2	8.5	1.6	1.5	8.8	7.9	0.0	5.8	5.6	3.9
Precipitation			0.7	1.5								2.2	21.9	53.6
Evaporation		1.4	3.5	4.0	1.7	2.6	3.0	1.8	1.4	1.4	1.8	22.6	21.4	23.9
Growing Degrees	5	6.7	7.7	7.1	5.1	3.7	3.7	3.8	3.1	2.3	1.8	44.7	57.7	62.3
	10	1.7	2.7	2.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	6.5	9.8	17.2

2nd 10-day period (11-20/12/2016)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	13.0	12.2	10.5
Precipitation - Reference Evapotranspiration	-10.8	9.7	43.1
Number of Rainy Days	2.0	1.0	4.7
Number of Dry Days	4.0	11.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

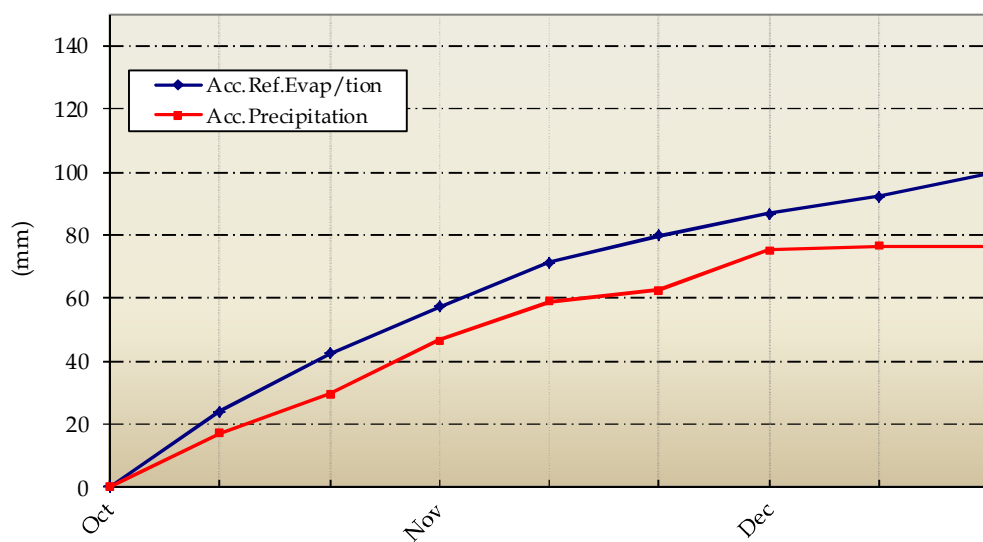


Larisa

2nd 10-day period (11-20/12/2016)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	14.6	14.5	12.2	8.4	9.6	9.0	7.9	8.1	10.6	9.1	10.4	10.6	11.0
	Min	-1.8	-1.2	1.0	-3.4	-5.1	4.6	1.8	-6.1	-6.5	-5.9	-2.3	0.4	1.7
Relative Humidity	Max	100	100	84	83	90	84	92	100	97	100	93	99	-
	Min	47	42	13	28	41	42	32	39	39	43	37	54	-
Soil Temperature at 10 cm	06 UTC	8.8	9.0	8.0	8.8	8.0	8.2	7.2	8.2	7.0	6.2	7.9	8.6	6.9
	12 UTC	9.0	9.0	9.2	8.6	8.0	8.2	8.2	7.2	6.4	5.8	8.0	8.6	7.3
Sunshine Duration		7.0	5.1	6.4	6.8	5.1	0.0	4.9	5.8	6.4	5.5	5.3	3.9	3.1
Precipitation												0.0	4.1	14.0
Evaporation		1.7	0.9	0.0	0.0	0.0	1.8	0.0	0.0	0.0	0.0	4.4	2.8	6.0
Growing Degrees	5	1.4	1.7	1.6	0.0	0.0	1.8	0.0	0.0	0.0	0.0	6.5	10.0	20.8
	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	2.1

2nd 10-day period (11-20/12/2016)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	7.1	4.8	5.8
Precipitation - Reference Evapotranspiration	-7.1	-0.7	8.2
Number of Rainy Days	0.0	1.0	3.3
Number of Dry Days	14.0	18.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

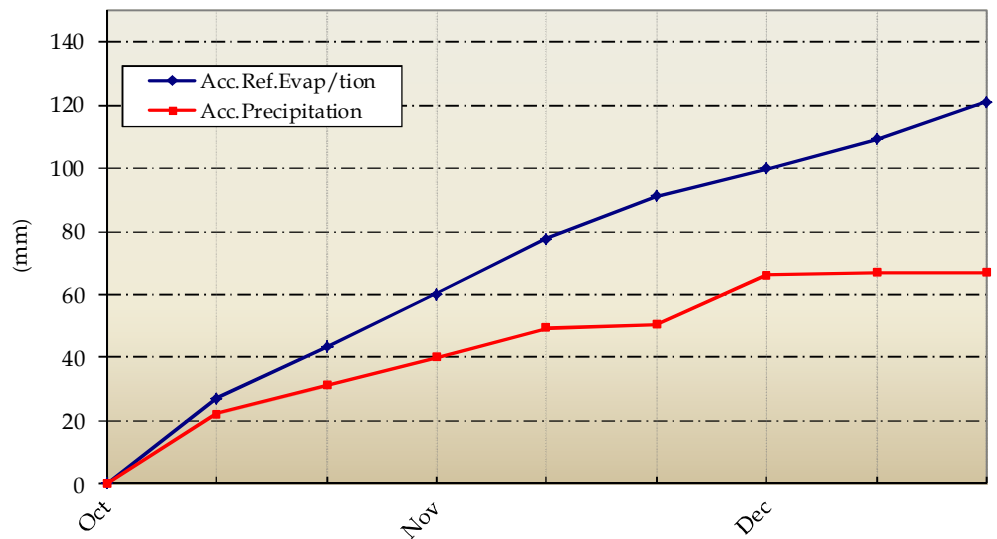


Mikra

2nd 10-day period (11-20/12/2016)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	14.9	13.9	12.0	7.0	10.7	6.8	8.0	8.8	9.4	11.1	10.3	11.9	10.6
	Min	0.2	0.0	4.6	-4.1	-3.9	3.6	-1.6	-5.2	-4.2	-4.4	-1.5	1.7	3.0
Relative Humidity	Max	89	93	65	83	91	83	85	78	91	85	84	87	-
	Min	35	37	31	42	40	43	27	31	44	33	36	46	-
Soil Temperature at 10 cm	06 UTC	5.8	4.9	7.8	4.4	4.0	5.8	2.8	3.0	3.0	2.6	4.4	6.4	6.2
	12 UTC	13.0	7.9	8.0	5.8	5.5	6.2	4.9	4.6	4.8	4.2	6.5	8.0	7.7
Sunshine Duration		8.1	6.4	7.0	7.0	3.7	0.5	8.0	6.8	7.7	7.6	6.3	5.8	2.8
Precipitation							0.0					0.0	0.0	12.5
Evaporation		1.9	3.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.6	12.1	10.6
Growing Degrees	5	2.6	2.0	3.3	0.0	0.0	0.2	0.0	0.0	0.0	0.0	8.0	18.0	24.9
	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	2.8

2nd 10-day period (11-20/12/2016)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	11.7	8.3	8.4
Precipitation - Reference Evapotranspiration	-11.7	-8.3	4.1
Number of Rainy Days	0.0	0.0	2.9
Number of Dry Days	16.0	23.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

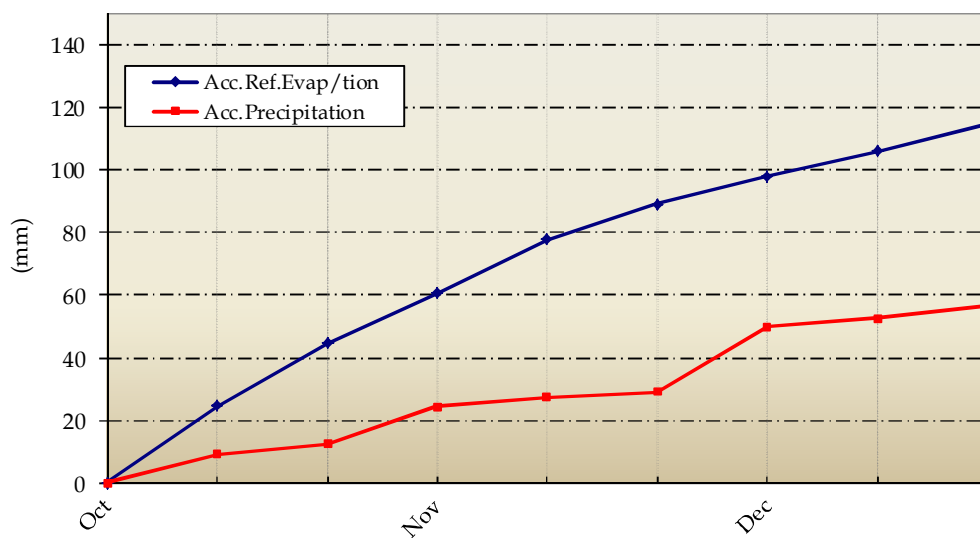


Tanagra

2nd 10-day period (11-20/12/2016)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	18.4	18.0	12.0	7.6	13.4	7.0	7.4	10.8	11.0	11.0	11.7	11.5	13.4
	Min	0.7	5.1	9.0	0.8	-1.9	4.8	3.8	-0.7	-1.8	-0.8	1.9	4.3	5.0
Relative Humidity	Max	97	82	80	81	95	100	77	79	95	95	88	95	-
	Min	48	31	30	40	27	70	39	24	50	54	41	57	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
Sunshine Duration		7.0	7.9	4.8	6.6	8.8	0.0	2.7	7.4	6.4	5.6	5.7	3.5	
Precipitation				0.4	0.1		3.6	0.0				4.1	10.2	25.9
Evaporation		-	-	-	-	-	-	-	-	-	-	-	16.1	
Growing Degrees	5	4.6	6.6	5.5	0.0	0.8	0.9	0.6	0.1	0.0	0.1	19.0	28.8	
	10	0.0	1.6	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.1	0.0	

2nd 10-day period (11-20/12/2016)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	8.4	7.7	
Precipitation - Reference Evapotranspiration	-4.3	2.5	25.9
Number of Rainy Days	3.0	3.0	4.3
Number of Dry Days	5.0	12.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

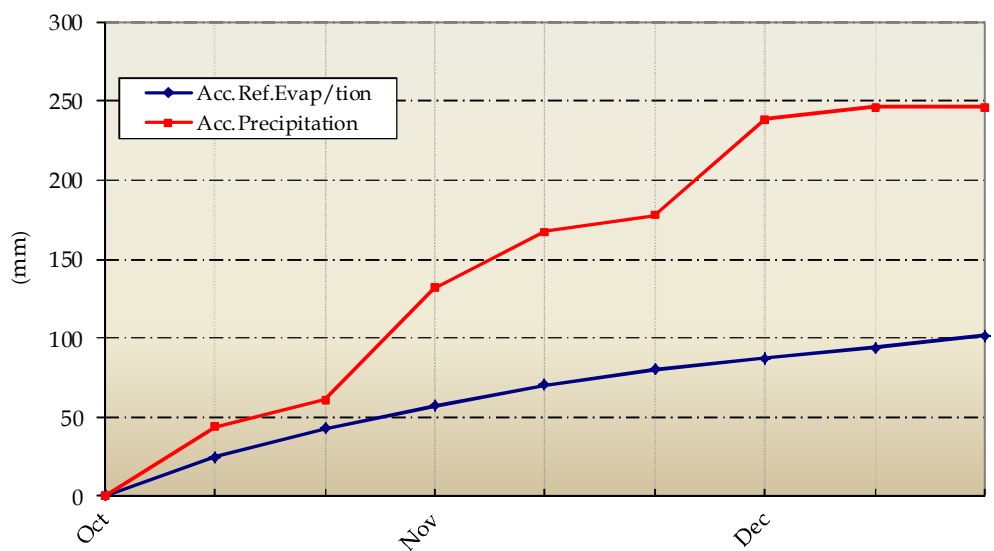


Tripoli

2nd 10-day period (11-20/12/2016)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	16.2	13.8	10.7	6.6	11.9	6.2	3.9	10.7	11.0	5.7	9.7	11.1	10.8
	Min	-2.3	2.3	2.4	-1.3	-5.1	1.4	0.6	-7.3	-7.5	-6.7	-2.4	-1.6	1.8
Relative Humidity	Max	75	100	100	91	97	89	80	92	98	99	92	99	-
	Min	29	47	46	37	44	60	55	23	23	53	42	47	-
Soil Temperature at 10 cm	06 UTC	-	6.0	7.0	5.2	3.0	5.2	4.4	2.2	1.6	1.4	4.0	4.3	6.0
	12 UTC	-	8.0	8.2	6.6	5.6	5.8	-	-	3.4	2.4	5.7	6.4	6.7
Sunshine Duration		7.5	5.8	4.0	7.5	7.6	0.2	3.0	7.7	6.9	0.0	5.0	4.0	3.6
Precipitation								0.0				0.0	2.1	40.9
Evaporation		0.0	1.8	0.8	0.0	0.0	0.7	0.0	0.0	0.0	0.0	3.3	1.4	10.0
Growing Degrees	5	2.0	3.1	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.6	2.1	19.6
	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	1.5

2nd 10-day period (11-20/12/2016)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	7.6	7.3	7.6
Precipitation - Reference Evapotranspiration	-7.6	-5.2	33.3
Number of Rainy Days	0.0	1.0	4.3
Number of Dry Days	13.0	12.0	-

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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