



# AGROMETEOROLOGICAL BULLETIN

*November 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



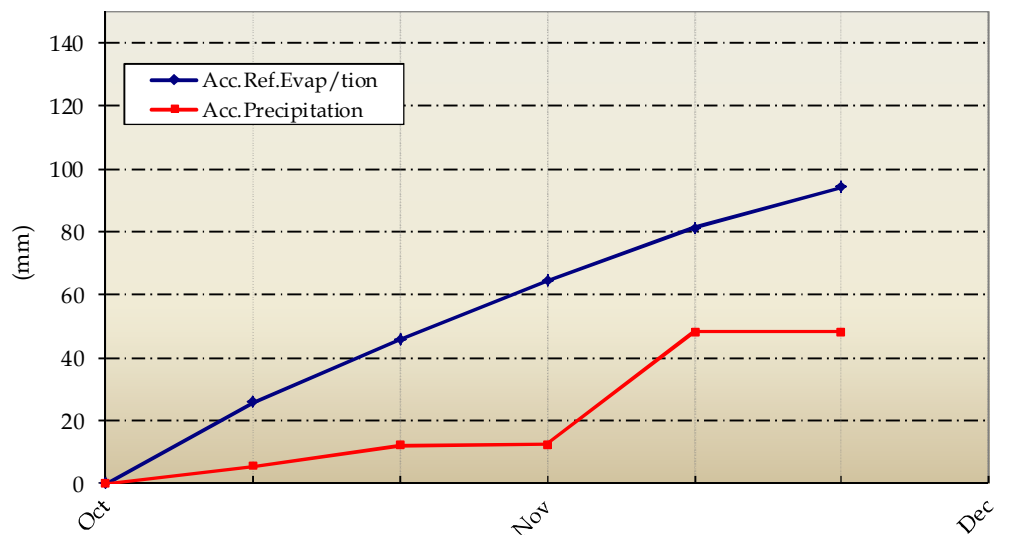
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2nd 10-day period (11-20/11/2016)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	20.4	20.0	18.4	13.2	10.4	10.2	12.6	15.2	17.6	17.2	15.5	18.5	14.4
	Min	10.6	8.6	10.0	4.4	5.0	-0.2	-2.6	0.0	-0.4	0.6	3.6	6.6	6.2
Relative Humidity	Max	92	93	83	65	61	82	92	92	92	88	84	93	-
	Min	61	71	34	17	35	37	38	39	30	42	40	60	-
Soil Temperature at 10 cm	06 UTC	16.6	13.0	14.4	10.6	9.7	10.0	6.0	6.8	7.0	7.8	10.2	11.7	9.7
	12 UTC	18.2	16.2	17.7	13.8	12.0	11.6	11.0	11.6	11.8	12.2	13.6	14.5	11.5
Sunshine Duration		8.0	1.9	8.7	7.0	3.9	8.7	8.3	8.0	8.2	7.6	7.0	6.3	3.9
Precipitation			0.0									0.0		29.1
Evaporation		2.4	6.3	2.7	6.0	1.0	0.0	0.0	2.5	0.5	3.8	25.2	15.4	18.6
Growing Degrees	5	10.5	9.3	9.2	3.8	2.7	0.0	0.0	2.6	3.6	3.9	45.6	75.4	54.2
	10	5.5	4.3	4.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14.0	25.4	17.6

2nd 10-day period (11-20/11/2016)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	13.0	9.0	11.3
Precipitation - Reference Evapotranspiration	-13.0	-9.0	17.8
Number of Rainy Days	0.0	0.0	2.9
Number of Dry Days	10.0	27.0	-

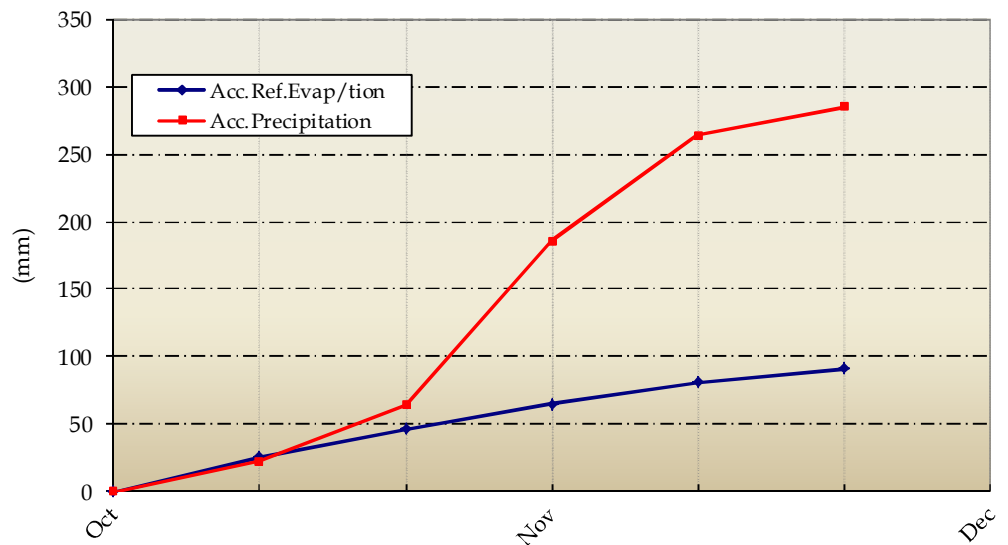
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



2nd 10-day period (11-20/11/2016)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	21.7	19.8	18.0	17.6	16.3	17.2	16.8	19.6	18.6	20.8	18.6	22.0	18.6
	Min	11.9	13.4	13.2	8.6	6.8	9.3	7.0	5.4	7.4	6.7	9.0	10.5	9.7
Relative Humidity	Max	87	93	86	84	91	91	89	91	90	90	89	91	-
	Min	49	69	42	49	58	38	48	41	45	44	48	54	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	13.2
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	15.2
Sunshine Duration		5.8	0.5	7.2	7.9	0.2	7.3	8.3	8.0	4.6	7.7	5.8	8.0	4.9
Precipitation		1.3	20.3									21.6		50.9
Evaporation		0.0	0.0	3.2	3.0	1.2	1.0	14.0	1.1	2.9	3.0	29.4	-	21.4
Growing Degrees	5	11.8	11.6	10.6	8.1	6.6	8.3	6.9	7.5	8.0	8.8	88.1	112.8	91.7
	10	6.8	6.6	5.6	3.1	1.6	3.3	1.9	2.5	3.0	3.8	38.1	62.8	42.4

2nd 10-day period (11-20/11/2016)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	10.2	12.6	11.8
Precipitation - Reference Evapotranspiration	11.4	-12.6	39.1
Number of Rainy Days	2.0	0.0	4.2
Number of Dry Days	1.0	28.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

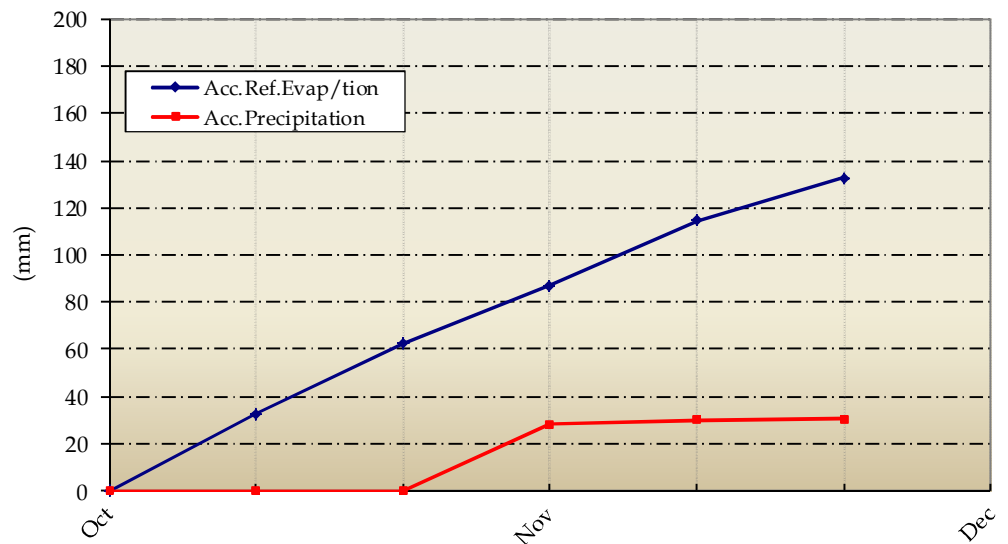


Iraklio

2nd 10-day period (11-20/11/2016)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	23.4	23.2	23.4	20.8	18.0	16.0	17.0	17.6	19.2	18.6	19.7	20.8	19.7
	Min	16.4	15.4	17.8	16.2	15.4	15.0	13.4	9.2	10.8	14.0	14.4	14.6	13.2
Relative Humidity	Max	84	84	81	79	79	70	78	83	85	86	81	90	-
	Min	52	61	56	50	60	65	57	57	67	58	58	68	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
Sunshine Duration		8.3	6.9	6.3	6.0	0.0	0.3	7.0	3.3	6.4	4.6	4.9	7.3	4.9
Precipitation						0.2						0.2		22.2
Evaporation		3.6	1.0	3.4	3.0	1.3	3.4	2.9	2.2	0.4	0.9	22.1	16.3	33.6
Growing Degrees	5	14.9	14.3	15.6	13.5	11.7	10.5	10.2	8.4	10.0	11.3	120.4	127.0	114.3
	10	9.9	9.3	10.6	8.5	6.7	5.5	5.2	3.4	5.0	6.3	70.4	77.0	64.3

2nd 10-day period (11-20/11/2016)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	18.0	17.0	-
Precipitation - Reference Evapotranspiration	-17.8	-17.0	22.2
Number of Rainy Days	1.0	0.0	2.7
Number of Dry Days	4.0	27.0	-

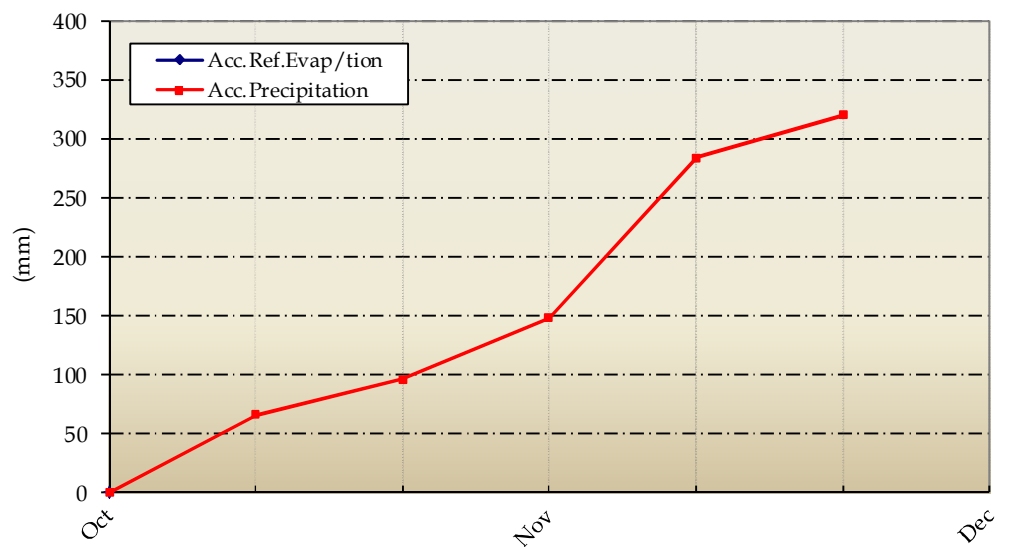
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



2nd 10-day period (11-20/11/2016)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	14.8	13.2	12.8	12.0	10.4	12.0	14.5	15.6	16.3	16.7	13.8	19.5	13.9
	Min	6.2	10.2	4.8	2.2	3.0	1.5	-1.0	-1.4	-0.8	0.4	2.5	3.4	4.6
Relative Humidity	Max	100	100	100	100	100	100	100	100	100	100	100	100	-
	Min	69	90	64	57	71	59	-	52	-	47	64	58	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	8.9
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	10.1
Sunshine Duration		2.1	-	0.8	2.2	0.0	5.6	-	4.4	-	5.3	2.9	4.0	3.0
Precipitation		5.5	24.9	1.4		4.0					0.0	35.8	0.0	63.6
Evaporation		-	-	-	-	-	-	-	-	-	-	-	-	13.4
Growing Degrees	5	5.5	6.7	3.8	2.1	1.7	1.8	1.8	2.1	2.8	3.6	31.7	64.5	44.8
	10	0.5	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.2	15.5	8.8

2nd 10-day period (11-20/11/2016)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	-	-	7.9
Precipitation - Reference Evapotranspiration	-	-	55.7
Number of Rainy Days	4.0	0.0	4.4
Number of Dry Days	0.0	29.0	-

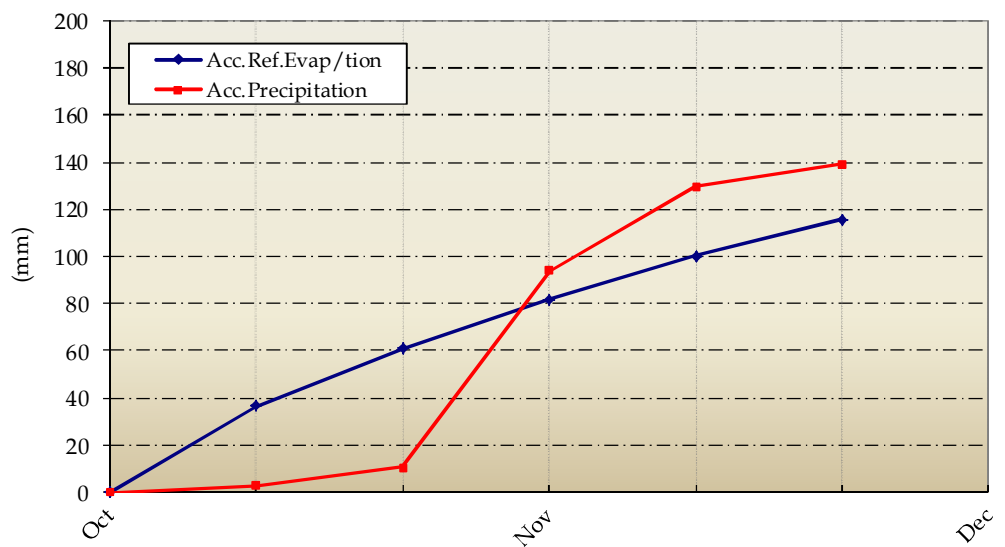
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



2nd 10-day period (11-20/11/2016)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	21.9	22.2	18.5	20.0	19.6	19.9	19.6	20.1	21.3	24.0	20.7	23.9	19.5
	Min	9.9	9.3	9.5	6.1	6.5	8.7	7.5	6.4	8.6	8.6	8.1	10.0	9.3
Relative Humidity	Max	94	94	93	89	89	91	90	91	89	88	91	92	-
	Min	44	57	42	40	47	41	40	51	44	42	45	41	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	16.4	14.0
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	17.3	15.4
Sunshine Duration		7.9	5.3	7.8	9.2	6.5	7.9	9.2	9.2	5.7	8.0	7.7	8.6	4.6
Precipitation			9.4	0.3		0.0						9.7		55.3
Evaporation		0.9	0.2	3.0	4.0	3.2	2.4	2.8	1.8	2.8	2.2	23.3	27.5	22.8
Growing Degrees	5	10.9	10.8	9.0	8.1	8.1	9.3	8.6	8.3	10.0	11.3	94.1	119.6	93.9
	10	5.9	5.8	4.0	3.1	3.1	4.3	3.6	3.3	5.0	6.3	44.1	69.6	44.2

2nd 10-day period (11-20/11/2016)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	15.4	19.1	13.4
Precipitation - Reference Evapotranspiration	-5.7	-19.1	41.9
Number of Rainy Days	2.0	0.0	3.8
Number of Dry Days	1.0	19.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

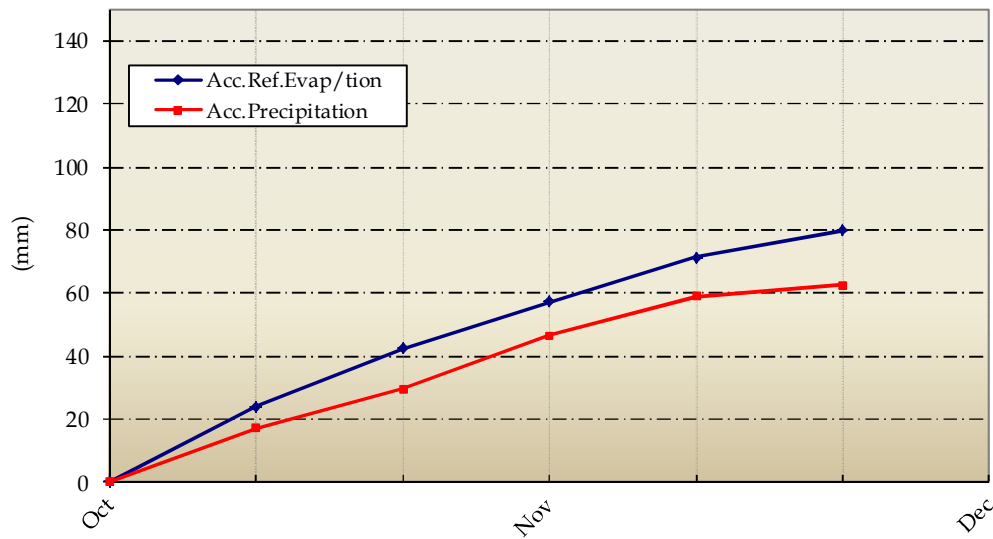


Larisa

2nd 10-day period (11-20/11/2016)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	20.4	19.2	18.4	14.4	10.4	12.4	13.4	15.0	15.6	16.0	15.5	21.8	15.3
	Min	6.8	8.8	6.4	2.4	5.8	4.4	-0.4	0.0	2.0	1.5	3.8	5.9	5.5
Relative Humidity	Max	100	100	92	100	100	100	100	100	100	100	99	100	-
	Min	42	61	35	44	47	46	53	53	60	55	50	43	-
Soil Temperature at 10 cm	06 UTC	16.0	15.6	15.6	14.6	14.2	13.6	13.4	12.8	12.4	12.4	14.1	13.8	10.9
	12 UTC	15.8	15.8	15.4	14.6	14.2	14.0	13.2	12.6	13.6	12.4	14.2	13.8	11.6
Sunshine Duration		6.3	1.6	7.2	4.6	0.0	6.0	6.0	6.3	6.2	4.1	4.8	6.0	3.5
Precipitation		0.3	0.8			1.8	0.5					3.4		21.2
Evaporation		1.4	0.6	2.6	1.4	0.7	1.4	1.0	2.0	1.0	1.2	13.3	18.7	13.7
Growing Degrees	5	8.6	9.0	7.4	3.4	3.1	3.4	1.5	2.5	3.8	3.8	46.5	88.7	54.7
	10	3.6	4.0	2.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.0	38.7	14.5

2nd 10-day period (11-20/11/2016)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	8.5	10.6	8.8
Precipitation - Reference Evapotranspiration	-5.1	-10.6	12.4
Number of Rainy Days	4.0	0.0	3.4
Number of Dry Days	1.0	27.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



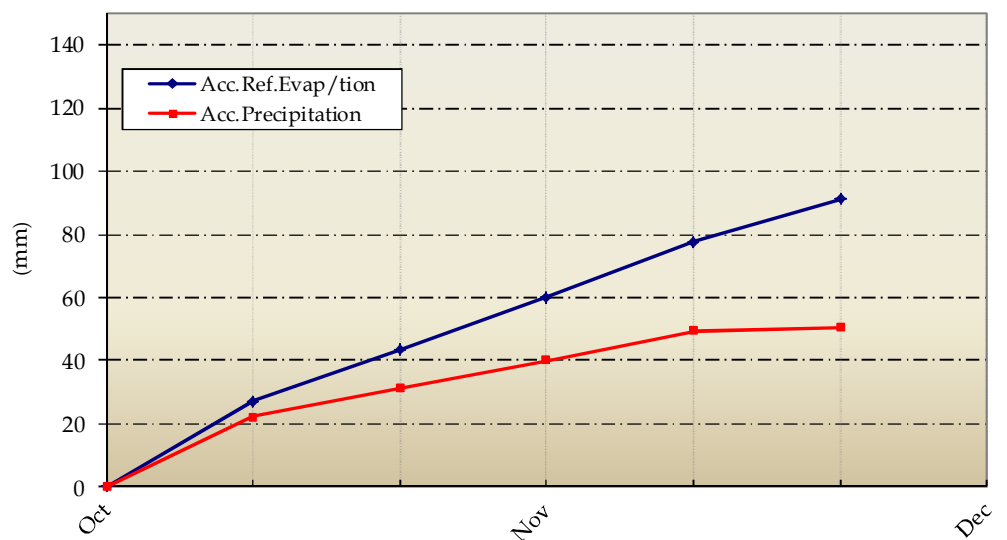


Mikra

2nd 10-day period (11-20/11/2016)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	19.9	20.6	17.2	13.0	9.4	10.8	12.9	14.2	15.1	15.6	14.9	20.5	14.7
	Min	11.0	12.7	6.0	7.4	7.5	1.2	0.4	2.2	2.8	4.1	5.5	9.0	6.8
Relative Humidity	Max	94	86	83	53	63	89	93	92	96	95	84	93	-
	Min	32	44	37	39	46	40	37	57	60	58	45	55	-
Soil Temperature at 10 cm	06 UTC	14.1	14.0	14.2	10.8	10.4	8.6	7.6	8.2	9.2	9.4	10.6	13.4	10.3
	12 UTC	15.0	15.2	14.5	12.0	10.8	10.6	10.0	10.5	11.0	11.6	12.1	15.2	12.2
Sunshine Duration		8.2	2.1	8.8	7.7	0.0	8.1	8.2	8.0	6.4	7.4	6.5	6.8	3.5
Precipitation			1.1			0.1						1.2		21.1
Evaporation		0.6	3.7	3.4	3.9	0.4	1.8	2.3	0.2	2.8	0.6	19.7	25.3	18.7
Growing Degrees	5	10.5	11.7	6.6	5.2	3.5	1.0	1.7	3.2	4.0	4.9	52.0	97.4	57.6
	10	5.5	6.7	1.6	0.2	0.0	0.0	0.0	0.0	0.0	0.0	13.9	47.4	17.1

2nd 10-day period (11-20/11/2016)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	13.2	12.4	11.2
Precipitation - Reference Evapotranspiration	-12.0	-12.4	9.9
Number of Rainy Days	2.0	0.0	3.0
Number of Dry Days	2.0	27.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



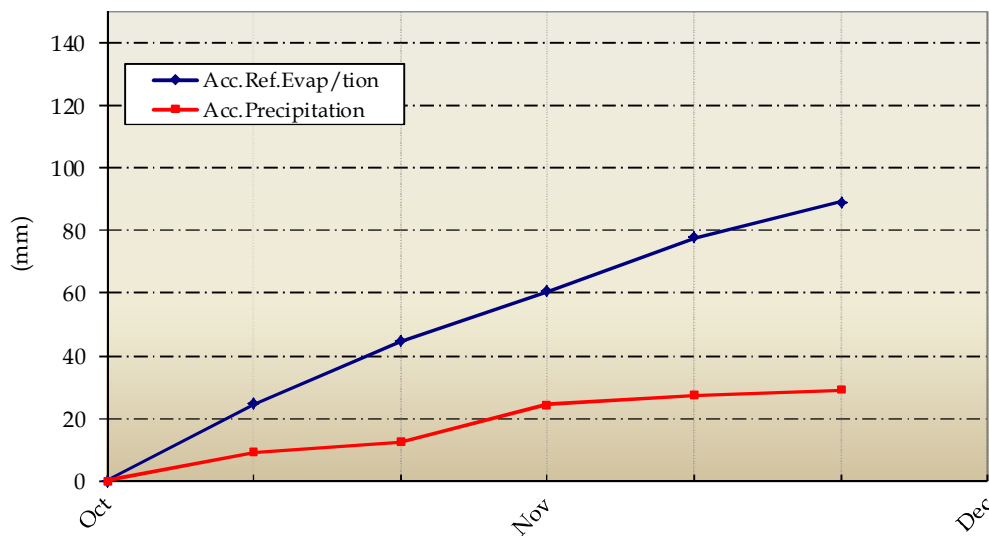


Tanagra

2nd 10-day period (11-20/11/2016)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	21.5	21.2	20.0	16.7	12.5	12.5	14.9	16.2	17.0	17.4	17.0	21.7	17.8
	Min	15.1	8.4	12.6	6.4	7.0	8.5	2.5	4.4	5.9	7.0	7.8	8.0	8.3
Relative Humidity	Max	82	96	74	78	97	97	98	97	97	97	91	96	-
	Min	31	43	22	47	61	52	42	49	48	50	44	46	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
Sunshine Duration		8.5	3.4	8.2	7.4	0.0	4.3	8.0	7.9	7.4	7.1	6.2	7.4	
Precipitation						0.1	1.4					1.5		21.4
Evaporation		4.0	4.4	4.1	2.5	2.0	1.0	1.3	2.0	1.7	2.0	25.0	24.0	
Growing Degrees	5	13.3	9.8	11.3	6.6	4.8	5.5	3.7	5.3	6.5	7.2	73.9	98.3	
	10	8.3	4.8	6.3	1.6	0.0	0.5	0.0	0.3	1.5	2.2	25.4	48.3	

2nd 10-day period (11-20/11/2016)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	11.2	10.1	
Precipitation - Reference Evapotranspiration	-9.7	-10.1	21.4
Number of Rainy Days	2.0	0.0	3.7
Number of Dry Days	5.0	27.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

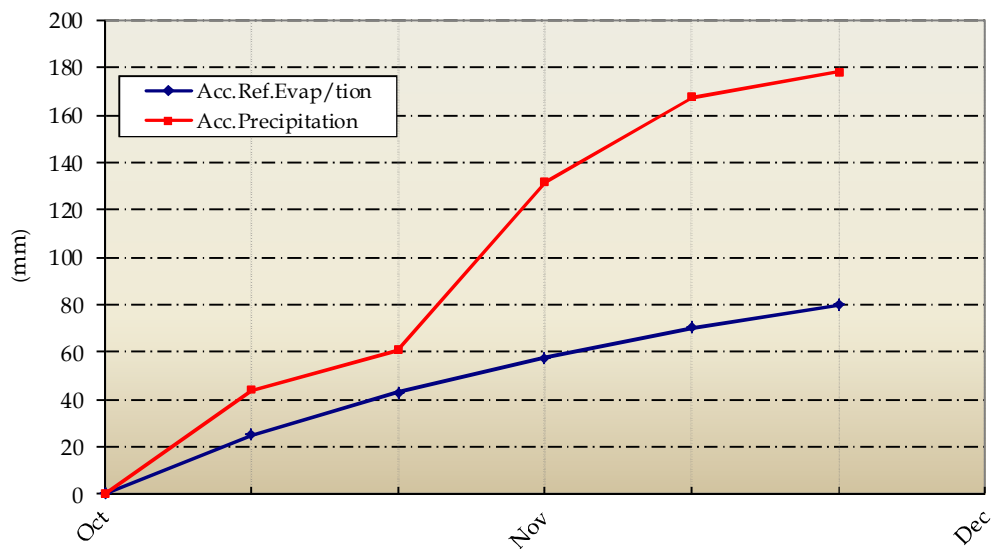


Tripoli

2nd 10-day period (11-20/11/2016)		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	15.6	14.2	15.4	13.9	14.4	15.0	15.7	13.2	15.8	15.0	21.6	14.9
	Min	10.2	5.8	6.5	-0.5	0.7	5.7	-0.3	0.8	0.6	0.0	3.0	2.6	4.4
Relative Humidity	Max	100	100	100	100	100	100	100	100	100	100	100	100	-
	Min	45	69	36	32	56	44	33	51	64	50	48	36	-
Soil Temperature at 10 cm	06 UTC	11.8	11.0	11.0	8.4	8.2	10.2	8.4	8.0	7.8	7.8	9.3	9.8	9.7
	12 UTC	14.2	-	-	11.2	10.8	12.2	11.2	11.0	-	-	11.8	12.8	10.8
Sunshine Duration		7.8	1.4	7.3	8.8	3.9	6.5	7.8	7.8	5.8	6.5	6.4	7.7	4.5
Precipitation		0.2	8.9	1.3		0.0	0.0					10.4		45.7
Evaporation		1.2	0.1	1.7	1.3	0.6	1.2	0.6	0.6	0.7	0.3	8.3	13.2	15.6
Growing Degrees	5	8.5	5.7	5.4	2.5	2.3	5.1	2.4	3.3	1.9	2.9	39.8	71.1	46.8
	10	3.5	0.7	0.4	0.0	0.0	0.1	0.0	0.0	0.0	0.0	4.6	21.1	10.1

2nd 10-day period (11-20/11/2016)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	9.8	12.1	10.5
Precipitation - Reference Evapotranspiration	0.6	-12.1	35.2
Number of Rainy Days	3.0	0.0	4.0
Number of Dry Days	0.0	28.0	-

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<sub>n</sub> 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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