



# AGROMETEOROLOGICAL BULLETIN

*October 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



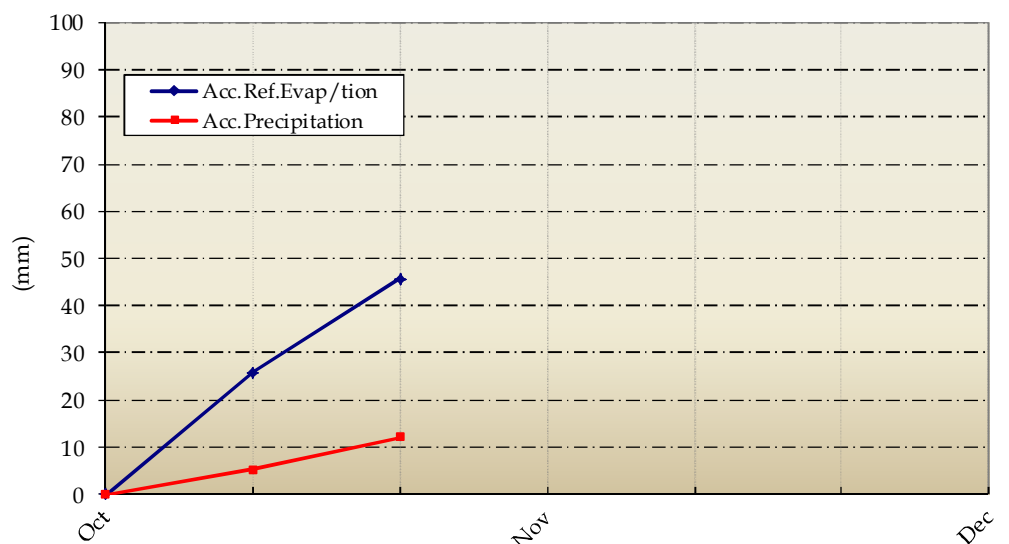
Hellenic National Meteorological Service  
Division of Climatology-Applications  
El. Venizelou Street 14, 16777  
Helliniko, Athens

*Web addresses of HNMS*  
[www.hnms.gr](http://www.hnms.gr)  
[www.emy.gov.gr](http://www.emy.gov.gr)  
[www.meteo.gov.gr](http://www.meteo.gov.gr)  
[www.meteohellas.gr](http://www.meteohellas.gr)

2nd 10-day period (11-20/10/2016)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	22.2	24.2	21.8	21.4	20.2	22.4	18.2	16.0	17.0	20.4	20.4	21.1	20.8
	Min	12.0	15.4	9.4	6.8	10.2	9.0	13.2	9.0	7.4	7.4	10.0	13.5	10.8
Relative Humidity	Max	94	96	96	91	75	91	83	77	83	83	87	90	-
	Min	58	71	71	42	44	43	60	46	50	46	53	60	-
Soil Temperature at 10 cm	06 UTC	18.6	19.2	16.2	15.2	15.8	16.0	18.6	14.6	14.4	14.6	16.3	16.7	15.2
	12 UTC	22.0	23.0	22.0	21.4	20.4	21.0	19.0	18.2	17.4	19.6	20.4	19.4	18.0
Sunshine Duration		3.1	6.8	10.4	10.0	9.0	7.4	1.6	5.6	3.1	7.6	6.5	6.2	5.9
Precipitation		3.7	2.7					0.4				6.8	23.1	15.0
Evaporation		0.3	3.1	3.2	4.2	4.7	2.9	3.8	2.9	2.6	3.1	30.8	34.0	42.1
Growing Degrees	5	12.1	14.8	10.6	9.1	10.2	10.7	10.7	7.5	7.2	8.9	101.8	123.0	107.7
	10	7.1	9.8	5.6	4.1	5.2	5.7	5.7	2.5	2.2	3.9	51.8	73.0	58.4

2nd 10-day period (11-20/10/2016)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	19.8	18.8	22.7
Precipitation - Reference Evapotranspiration	-13.0	4.3	-7.7
Number of Rainy Days	3.0	2.0	1.9
Number of Dry Days	2.0	4.0	-

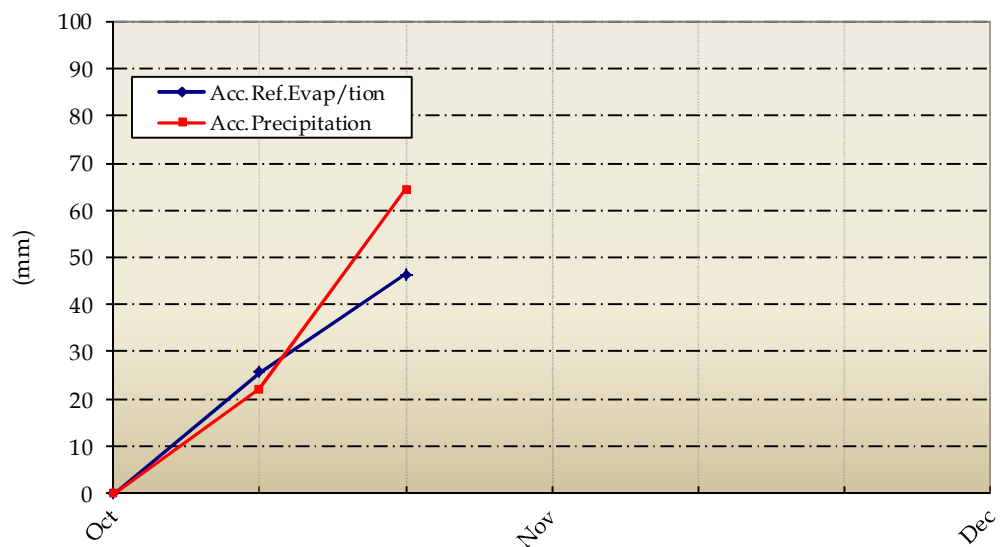
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



2nd 10-day period (11-20/10/2016)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	25.2	25.0	21.8	25.8	28.1	25.3	26.6	22.8	22.0	21.5	24.4	25.6	24.1
	Min	16.6	17.2	11.3	9.8	12.0	14.9	14.3	9.5	9.6	13.9	12.9	16.9	13.2
Relative Humidity	Max	92	87	90	89	91	91	92	90	89	90	90	87	-
	Min	63	55	38	26	35	63	41	35	53	65	47	49	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	18.6
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	21.5
Sunshine Duration		4.3	3.3	8.3	8.6	9.1	5.2	8.1	8.5	3.4	0.9	6.0	6.4	7.1
Precipitation		42.0	0.2									42.2	7.7	23.9
Evaporation		0.0	2.0	5.2	5.8	3.8	1.2	4.1	4.9	1.0	6.6	34.6	23.6	36.4
Growing Degrees	5	15.9	16.1	11.6	12.8	15.1	15.1	15.5	11.2	10.8	12.7	136.6	162.2	136.6
	10	10.9	11.1	6.6	7.8	10.1	10.1	10.5	6.2	5.8	7.7	86.6	112.2	86.6

2nd 10-day period (11-20/10/2016)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	20.8	21.8	22.5
Precipitation - Reference Evapotranspiration	21.4	-14.1	1.4
Number of Rainy Days	2.0	1.0	2.6
Number of Dry Days	0.0	0.0	-

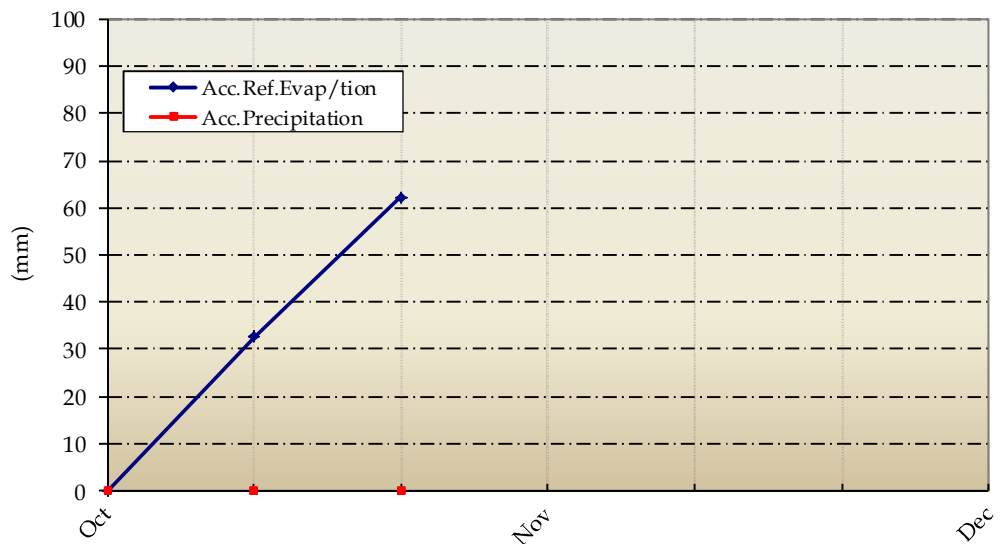
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



2nd 10-day period (11-20/10/2016)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	30.0	26.6	25.0	23.8	24.2	25.0	24.0	19.8	20.6	22.2	24.1	25.6	24.0
	Min	20.0	23.4	18.2	15.0	19.0	21.0	18.0	18.4	18.2	18.6	19.0	18.9	17.1
Relative Humidity	Max	89	85	84	86	81	90	88	76	71	75	82	86	-
	Min	36	61	52	49	53	61	68	55	52	64	55	57	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
Sunshine Duration		2.3	6.9	9.0	9.4	8.0	8.3	1.6	2.7	6.1	4.3	5.9	7.5	6.5
Precipitation													0.0	12.5
Evaporation		5.3	3.3	6.7	4.5	5.5	2.1	5.3	5.6	3.5	2.0	43.8	33.0	49.3
Growing Degrees	5	20.0	20.0	16.6	14.4	16.6	18.0	16.0	14.1	14.4	15.4	165.5	172.8	155.9
	10	15.0	15.0	11.6	9.4	11.6	13.0	11.0	9.1	9.4	10.4	115.5	122.8	105.9

2nd 10-day period (11-20/10/2016)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	29.6	28.4	-
Precipitation - Reference Evapotranspiration	-29.6	-28.4	12.5
Number of Rainy Days	0.0	0.0	1.7
Number of Dry Days	27.0	20.0	-

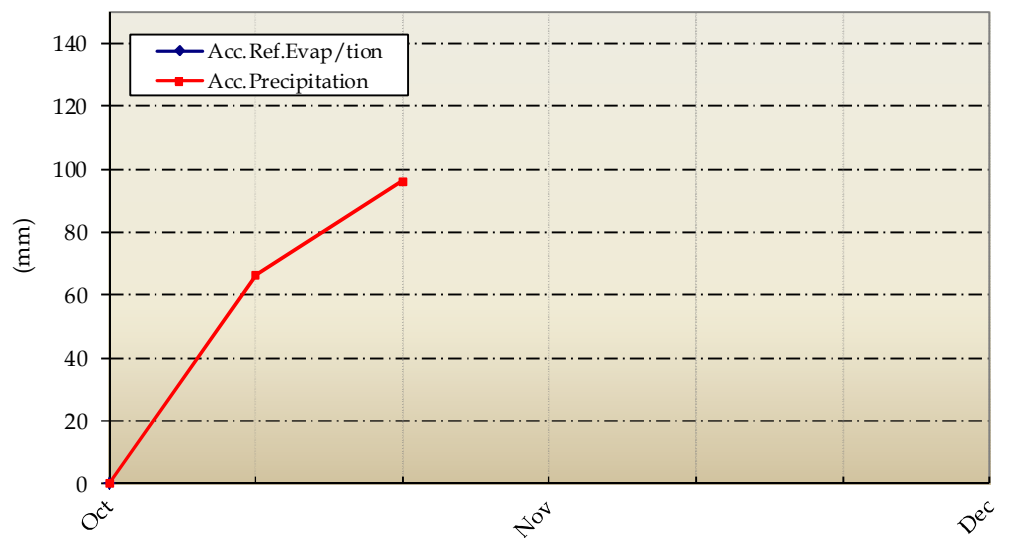
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



2nd 10-day period (11-20/10/2016)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	16.4	18.4	19.2	22.0	26.0	23.5	23.0	20.2	17.9	20.1	20.7	22.0	20.6
	Min	10.8	10.2	2.0	4.0	7.0	8.1	7.4	6.2	8.7	5.8	7.0	10.8	8.9
Relative Humidity	Max	100	100	100	100	100	100	100	100	100	100	100	100	-
	Min	88	59	35	45	38	43	34	41	72	62	52	56	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	14.0
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	16.3
Sunshine Duration		0.0	3.8	7.0	8.1	6.6	3.5	6.9	7.5	1.9	3.9	4.9	4.4	5.3
Precipitation		21.5	6.5			0.0	1.6			0.2		29.8	59.2	37.1
Evaporation		-	-	-	-	-	-	-	-	-	-	-	-	30.1
Growing Degrees	5	8.6	9.3	5.6	8.0	11.5	10.8	10.2	8.2	8.3	8.0	88.5	114.2	98.7
	10	3.6	4.3	0.6	3.0	6.5	5.8	5.2	3.2	3.3	3.0	38.5	64.2	49.1

2nd 10-day period (11-20/10/2016)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	-	-	17.6
Precipitation - Reference Evapotranspiration	-	-	19.5
Number of Rainy Days	4.0	5.0	3.4
Number of Dry Days	0.0	0.0	-

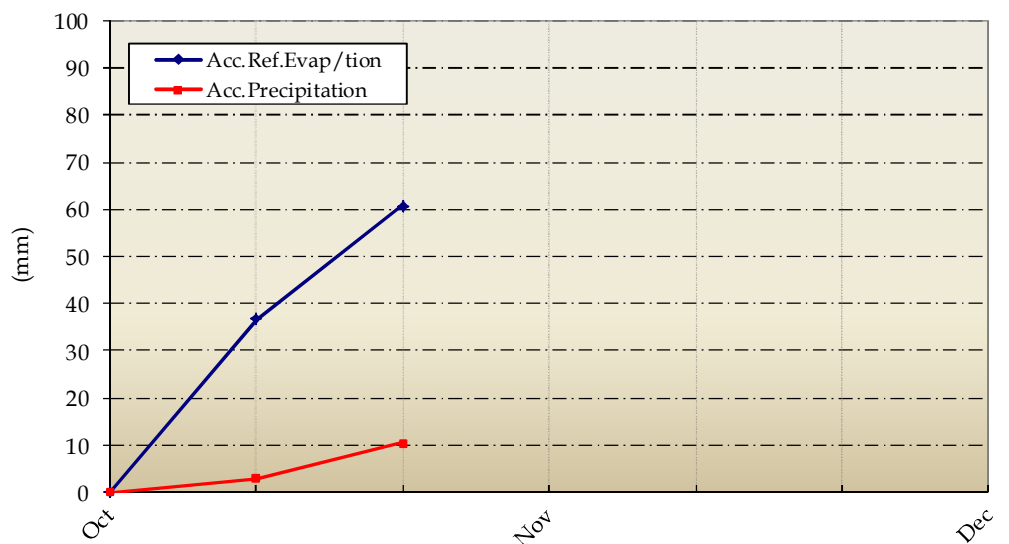
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



2nd 10-day period (11-20/10/2016)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	25.9	26.2	24.8	25.5	26.5	26.1	26.2	24.9	19.7	22.6	24.8	27.0	24.7
	Min	17.0	14.4	11.0	9.0	11.9	13.1	15.3	15.2	11.4	16.3	13.5	15.4	13.1
Relative Humidity	Max	94	94	90	88	90	92	92	79	93	93	90	92	-
	Min	66	49	25	31	38	43	55	30	65	58	46	44	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	21.1	18.6
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	21.9	20.9
Sunshine Duration		2.4	8.1	10.0	10.0	9.3	7.8	8.6	9.2	1.0	4.5	7.1	7.8	6.8
Precipitation		3.4	0.7					1.6		0.1	1.8	7.6	1.9	24.4
Evaporation		1.4	1.7	2.2	2.9	2.9	6.4	5.4	4.0	2.3	0.4	29.6	52.8	39.0
Growing Degrees	5	16.5	15.3	12.9	12.3	14.2	14.6	15.8	15.1	10.6	14.5	141.5	161.9	138.6
	10	11.5	10.3	7.9	7.3	9.2	9.6	10.8	10.1	5.6	9.5	91.5	111.9	88.6

2nd 10-day period (11-20/10/2016)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	24.2	27.2	24.3
Precipitation - Reference Evapotranspiration	-16.6	-25.3	0.1
Number of Rainy Days	5.0	1.0	2.7
Number of Dry Days	2.0	0.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

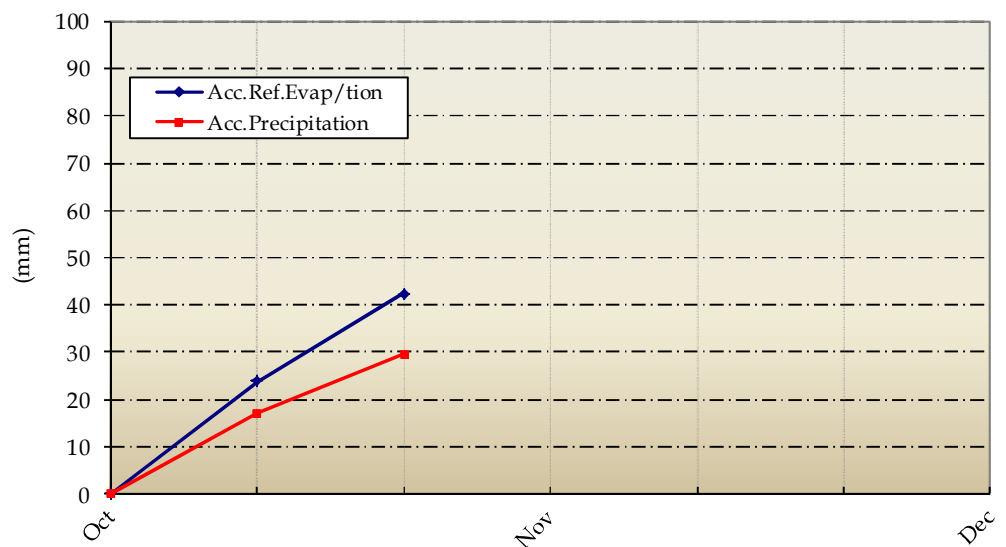


Larisa

2nd 10-day period (11-20/10/2016)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	21.2	23.7	22.0	24.1	22.6	21.5	21.4	17.4	18.8	19.4	21.2	22.9	23.0
	Min	13.4	13.0	7.6	7.2	11.0	12.2	12.8	13.6	9.4	12.6	11.3	15.3	10.1
Relative Humidity	Max	100	100	92	100	100	100	100	79	96	92	96	100	-
	Min	65	41	28	31	54	63	56	46	46	54	48	59	-
Soil Temperature at 10 cm	06 UTC	20.2	20.0	18.6	17.8	19.0	19.2	19.0	18.6	18.4	18.6	18.9	20.1	17.2
	12 UTC	20.0	20.0	19.2	18.6	20.8	19.0	18.8	18.4	18.0	18.4	19.1	20.4	18.6
Sunshine Duration		3.2	4.0	7.2	7.4	7.0	3.2	2.4	0.8	4.4	1.5	4.1	2.7	5.6
Precipitation		11.4	0.9					0.2				12.5	15.7	14.1
Evaporation		0.0	0.6	3.2	3.2	3.5	0.7	4.5	3.7	2.4	1.0	22.8	16.7	31.3
Growing Degrees	5	12.3	13.4	9.8	10.7	11.8	11.9	12.1	10.5	9.1	11.0	112.5	140.7	115.6
	10	7.3	8.4	4.8	5.7	6.8	6.9	7.1	5.5	4.1	6.0	62.5	90.7	65.8

2nd 10-day period (11-20/10/2016)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	18.5	15.9	20.6
Precipitation - Reference Evapotranspiration	-6.0	-0.2	-6.5
Number of Rainy Days	3.0	2.0	2.4
Number of Dry Days	0.0	0.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

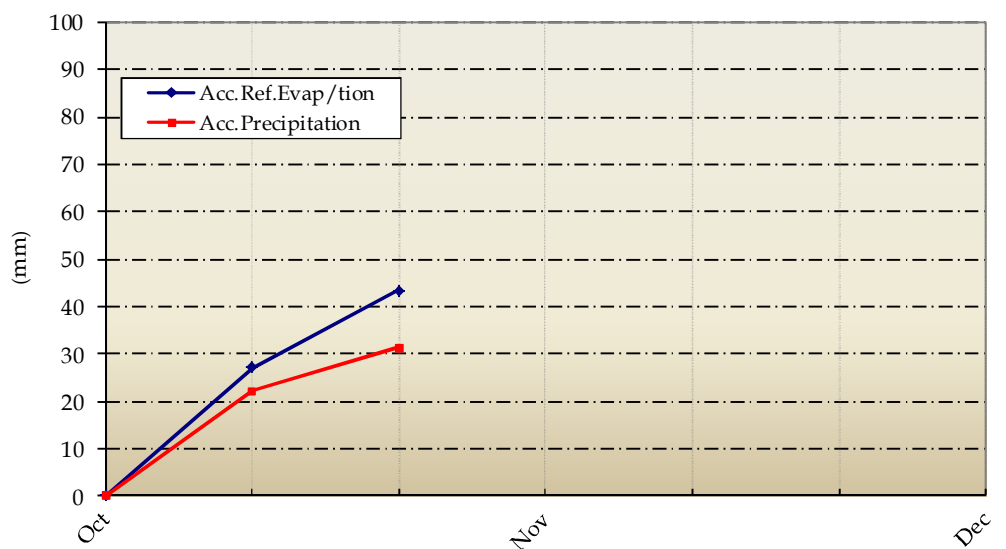


Mikra

2nd 10-day period (11-20/10/2016)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	20.0	23.4	20.9	21.4	18.8	21.0	19.2	16.8	15.8	16.2	19.4	22.1	21.6
	Min	15.8	16.4	12.7	7.9	13.0	16.4	16.2	10.2	9.9	12.7	13.1	16.2	11.6
Relative Humidity	Max	97	94	77	93	93	89	62	75	70	91	84	91	-
	Min	82	44	32	42	65	65	54	38	49	73	54	63	-
Soil Temperature at 10 cm	06 UTC	18.0	17.0	16.0	16.1	17.2	18.0	18.2	16.6	15.4	15.9	16.8	18.9	16.5
	12 UTC	19.2	19.0	19.4	18.2	18.0	14.2	19.2	19.0	18.8	17.0	18.2	20.2	19.4
Sunshine Duration		0.1	6.4	9.9	9.0	0.0	1.3	1.3	2.2	0.0	0.1	3.0	3.5	5.3
Precipitation		8.7	0.5							0.0		9.2	20.0	13.0
Evaporation		4.7	3.6	1.8	3.9	1.1	1.2	3.5	2.1	0.4	4.1	26.4	25.9	31.8
Growing Degrees	5	12.9	14.9	11.8	9.7	10.9	13.7	12.7	8.5	7.9	9.5	112.4	141.6	116.2
	10	7.9	9.9	6.8	4.7	5.9	8.7	7.7	3.5	2.9	4.5	62.4	91.6	66.2

2nd 10-day period (11-20/10/2016)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	16.2	17.5	20.4
Precipitation - Reference Evapotranspiration	-7.0	2.5	-7.4
Number of Rainy Days	2.0	2.0	2.0
Number of Dry Days	0.0	0.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



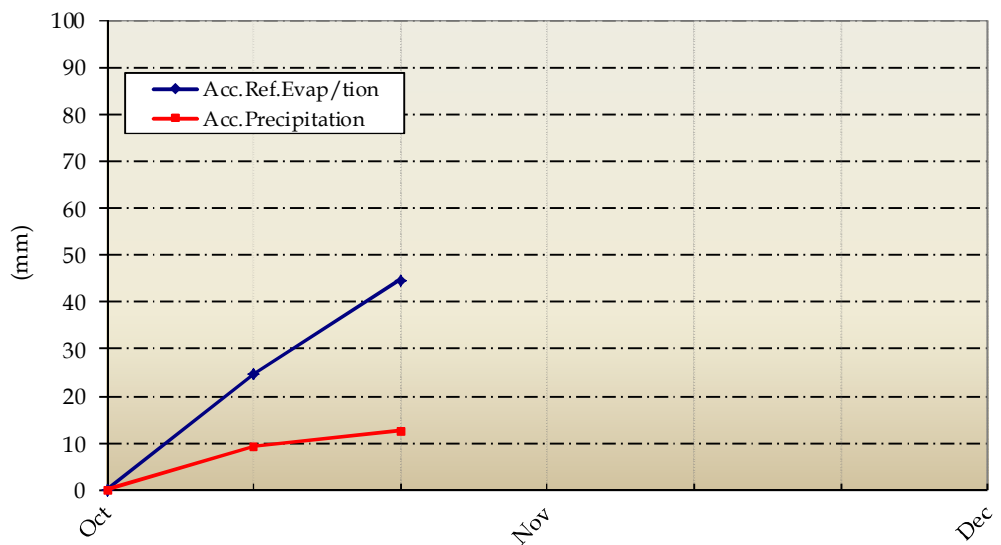


Tanagra

2nd 10-day period (11-20/10/2016)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	25.8	27.6	23.2	24.1	22.4	22.6	20.5	16.9	19.9	19.2	22.2	23.0	22.8
	Min	14.2	17.4	9.8	9.6	11.8	12.2	13.9	14.2	11.0	14.0	12.8	14.5	12.0
Relative Humidity	Max	98	89	82	85	96	98	95	71	69	78	86	98	-
	Min	49	32	18	32	47	54	54	44	42	49	42	49	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
Sunshine Duration		4.5	5.7	9.2	9.2	5.8	5.0	1.6	3.4	8.4	1.3	5.4	5.4	
Precipitation		3.3										3.3	25.2	11.3
Evaporation		-	-	-	-	-	-	-	-	-	-	-	26.5	
Growing Degrees	5	15.0	17.5	11.5	11.9	12.1	12.4	12.2	10.6	10.5	11.6	125.2	137.7	
	10	10.0	12.5	6.5	6.9	7.1	7.4	7.2	5.6	5.5	6.6	75.2	87.7	

2nd 10-day period (11-20/10/2016)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	20.0	18.1	
Precipitation - Reference Evapotranspiration	-16.7	7.1	11.3
Number of Rainy Days	1.0	1.0	2.5
Number of Dry Days	2.0	0.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

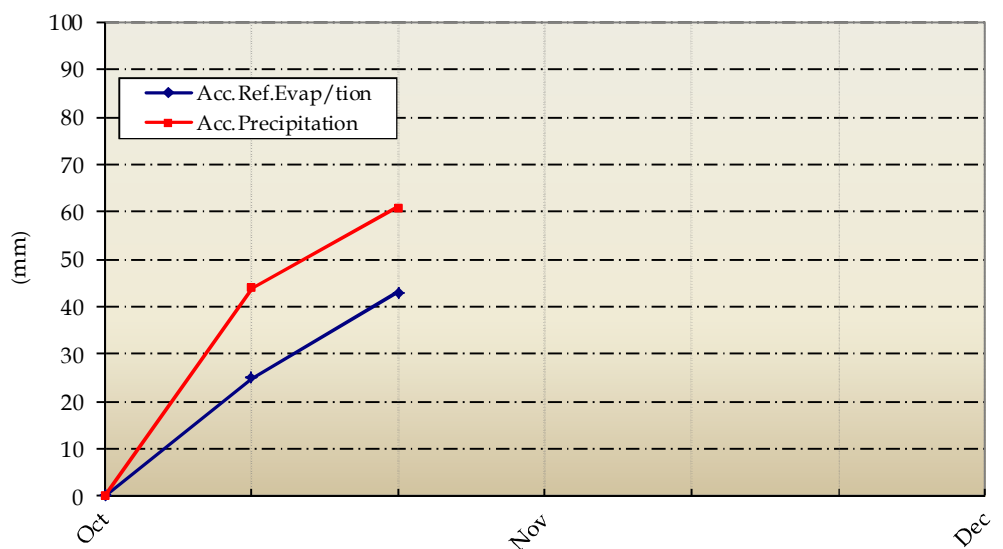


Tripoli

2nd 10-day period (11-20/10/2016)		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	20.6	20.8	25.1	24.3	26.8	22.1	17.5	19.6	17.4	21.6	23.0	21.3
	Min	9.1	14.4	5.5	3.8	6.3	8.1	9.0	10.4	5.1	11.2	8.3	11.1	8.2
Relative Humidity	Max	100	100	80	100	100	100	100	86	100	90	96	100	-
	Min	62	58	40	21	48	26	49	51	58	66	48	48	-
Soil Temperature at 10 cm	06 UTC	16.2	16.4	13.8	13.2	-	-	15.6	15.2	14.2	15.8	15.0	17.0	15.5
	12 UTC	18.0	19.4	18.4	17.8	-	-	18.8	17.4	16.8	17.2	18.0	19.4	17.2
Sunshine Duration		2.1	6.6	-	-	-	0.0	6.8	6.4	3.8	2.6	4.0	6.7	6.8
Precipitation		9.3	7.7				0.0			0.0	0.0	17.0	24.6	15.9
Evaporation		1.5	2.3	2.5	-	-	-	3.4	2.8	0.5	2.0	-	-	28.1
Growing Degrees	5	10.3	12.5	8.2	9.5	10.3	12.5	10.6	9.0	7.4	9.3	99.3	120.8	97.5
	10	5.3	7.5	3.2	4.5	5.3	7.5	5.6	4.0	2.4	4.3	49.3	70.8	48.2

2nd 10-day period (11-20/10/2016)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	18.1	20.2	21.4
Precipitation - Reference Evapotranspiration	-1.1	4.4	-5.5
Number of Rainy Days	2.0	3.0	2.7
Number of Dry Days	2.0	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<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

© HELLENIC NATIONAL METEOROLOGICAL SERVICE  
 Reproduction is prohibited without written permission  
 El. Venizelou street 14, Zip Code 16777  
 Helliniko, Athens