



# AGROMETEOROLOGICAL BULLETIN

*January 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



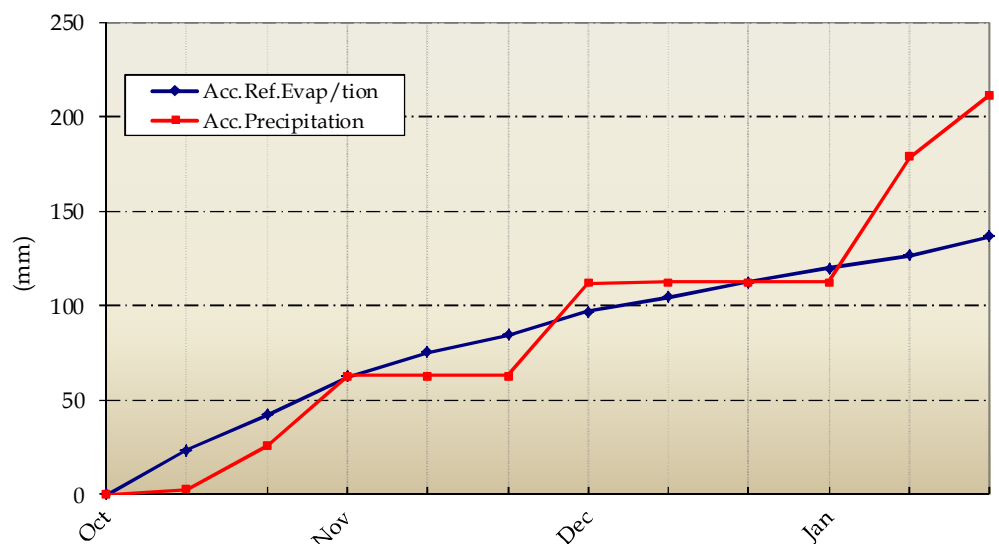
Hellenic National Meteorological Service  
Division of Climatology-Applications  
El. Venizelou Street 14, 16777  
Helliniko, Athens

*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 (11-20/01/2016)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	17.4	17.2	15.0	12.8	14.4	15.8	15.4	2.8	3.0	5.8	12.0	12.0	8.0
	Min	6.8	12.4	5.6	3.4	2.4	12.4	2.8	-1.4	-2.0	-2.0	4.0	1.1	0.2
Relative Humidity	Max	97	96	94	90	96	93	93	84	88	75	91	94	-
	Min	70	72	62	47	70	68	61	58	52	46	61	68	-
Soil Temperature at 10 cm	06 UTC	8.4	10.6	11.0	7.0	6.4	10.6	12.0	4.6	2.0	2.2	7.5	4.0	4.2
	12 UTC	11.0	13.5	11.4	9.4	8.5	11.6	10.6	4.4	3.6	4.4	8.8	6.1	5.1
Sunshine Duration		7.3	5.7	6.9	8.2	1.8	0.0	0.0	1.0	5.8	0.7	3.7	5.6	3.1
Precipitation		0.1	2.9	0.8			8.5	20.0	0.0			32.3	27.4	11.4
Evaporation		0.5	0.9	1.5	1.2	1.8	0.9	0.0	0.0	0.0	0.0	6.8	2.6	6.6
Growing Degrees	5	7.1	9.8	5.3	3.1	3.4	9.1	4.1	0.0	0.0	0.0	41.9	23.5	9.4
	10	2.1	4.8	0.3	0.0	0.0	4.1	0.0	0.0	0.0	0.0	11.3	4.4	0.9

2nd 10-day period (11-20/01/2016)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	10.4	6.6	8.8
Precipitation - Reference Evapotranspiration	21.9	20.8	2.6
Number of Rainy Days	5.0	1.0	2.2
Number of Dry Days	0.0	7.0	-

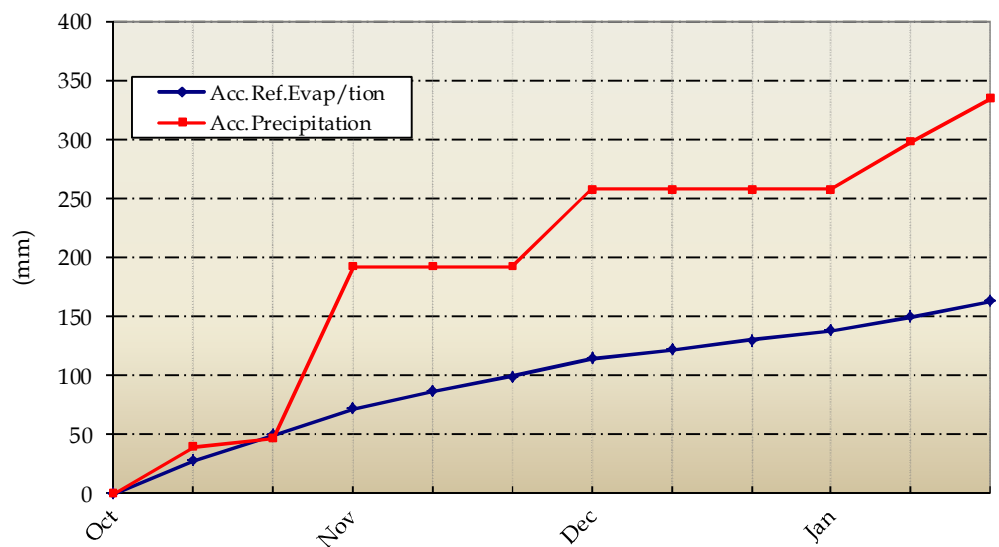
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



2nd 10-day period (11-20/01/2016)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	19.0	18.7	16.8	15.2	15.7	17.2	14.8	9.8	9.8	9.6	14.7	16.2	13.6
	Min	11.7	11.8	10.4	4.4	6.9	14.4	7.2	4.0	1.7	5.2	7.8	4.9	4.8
Relative Humidity	Max	91	85	86	85	79	88	87	87	87	90	86	83	-
	Min	69	69	52	36	59	69	50	52	42	73	57	47	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	8.8	8.3
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	11.2	9.8
Sunshine Duration		6.6	6.4	6.1	8.9	1.9	0.0	1.9	4.6	3.5	1.4	4.1	6.2	4.4
Precipitation							8.4	11.6	1.1	2.0	13.7	36.8	1.0	33.0
Evaporation		1.0	1.0	1.0	1.0	5.1	9.3	1.6	1.1	1.9	0.4	23.4	16.0	18.1
Growing Degrees	5	10.4	10.3	8.6	4.8	6.3	10.8	6.0	1.9	0.8	2.4	62.2	55.6	42.4
	10	5.4	5.3	3.6	0.0	1.3	5.8	1.0	0.0	0.0	0.0	22.3	12.4	7.2

2nd 10-day period (11-20/01/2016)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	12.8	12.9	9.4
Precipitation - Reference Evapotranspiration	24.0	-11.9	23.6
Number of Rainy Days	5.0	2.0	3.7
Number of Dry Days	5.0	12.0	-

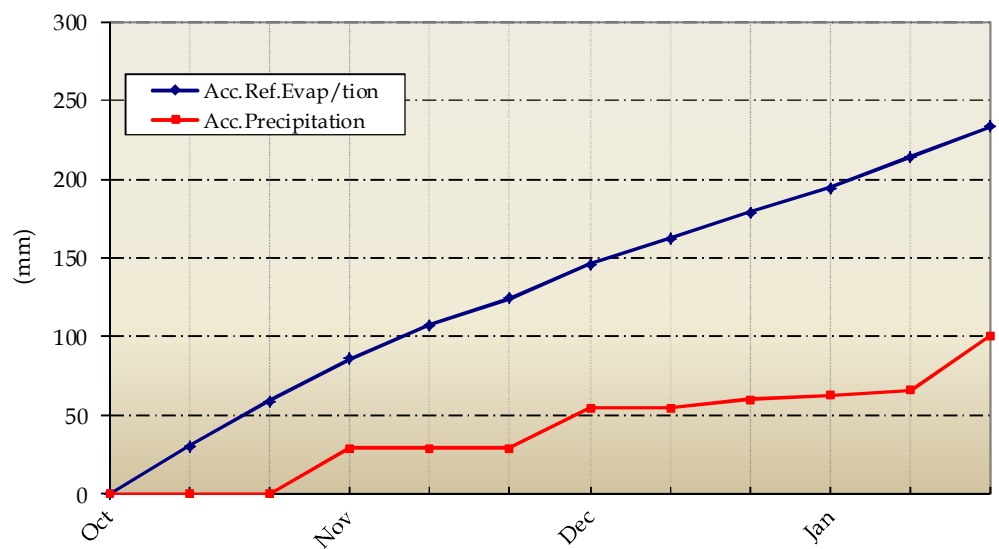
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



2nd 10-day period (11-20/01/2016)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	23.0	23.0	20.2	17.2	19.2	17.2	15.6	11.6	9.2	15.0	17.1	16.8	14.7
	Min	13.0	14.4	15.0	14.0	6.8	12.2	15.4	8.2	6.6	5.4	11.1	9.9	9.1
Relative Humidity	Max	83	76	76	75	77	74	89	85	90	92	82	86	-
	Min	50	44	54	53	39	53	63	46	70	58	53	59	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
Sunshine Duration		8.1	8.0	6.8	7.4	7.8	4.5	1.2	5.1	1.5	1.1	5.2	5.6	3.7
Precipitation								0.0	19.1	5.2	10.2	34.5	79.6	28.7
Evaporation		1.5	3.0	4.4	0.4	3.3	2.4	3.0	2.3	0.9	1.3	22.5	22.2	24.1
Growing Degrees	5	13.0	13.7	12.6	10.6	8.0	9.7	10.5	4.9	2.9	5.2	91.1	83.5	68.9
	10	8.0	8.7	7.6	5.6	3.0	4.7	5.5	0.0	0.0	0.2	43.3	33.7	21.0

2nd 10-day period (11-20/01/2016)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	19.6	18.8	-
Precipitation - Reference Evapotranspiration	14.9	60.8	28.7
Number of Rainy Days	3.0	3.0	4.2
Number of Dry Days	10.0	1.0	-

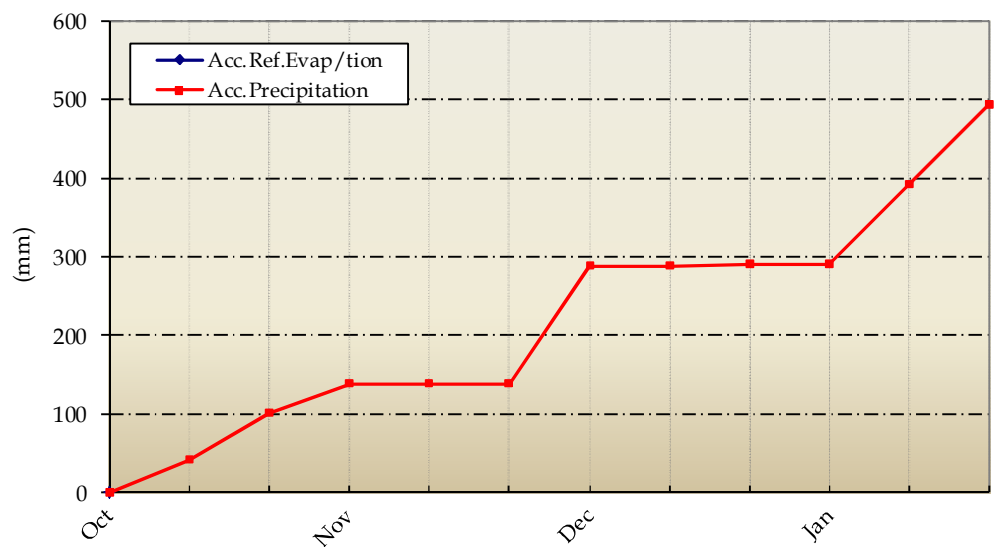
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



2nd 10-day period (11-20/01/2016)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	15.5	14.0	10.6	9.1	9.0	11.1	5.6	5.0	60.0	9.5	14.9	12.8	8.7
	Min	7.4	7.0	4.2	0.4	-0.2	8.1	1.9	-1.0	-7.0	-0.2	2.1	-1.0	-0.4
Relative Humidity	Max	100	90	100	100	100	100	99	69	90	98	95	99	-
	Min	71	83	72	70	91	80	65	43	24	42	64	45	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	3.2
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	3.8
Sunshine Duration		1.7	0.0	1.6	-	0.0	-	0.0	5.9	6.1	3.7	2.4	1.9	3.0
Precipitation		0.2	1.2	5.6	0.7	18.0	73.7	1.9	0.1	0.0		101.4	15.7	26.9
Evaporation		-	-	-	-	-	-	-	-	-	-	-	-	4.4
Growing Degrees	5	6.5	5.5	2.4	0.0	0.0	4.6	0.0	0.0	21.5	0.0	40.5	12.3	9.3
	10	1.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	16.5	0.0	18.5	1.2	0.3

2nd 10-day period (11-20/01/2016)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	-	-	6.6
Precipitation - Reference Evapotranspiration	-	-	20.3
Number of Rainy Days	8.0	4.0	2.9
Number of Dry Days	0.0	7.0	-

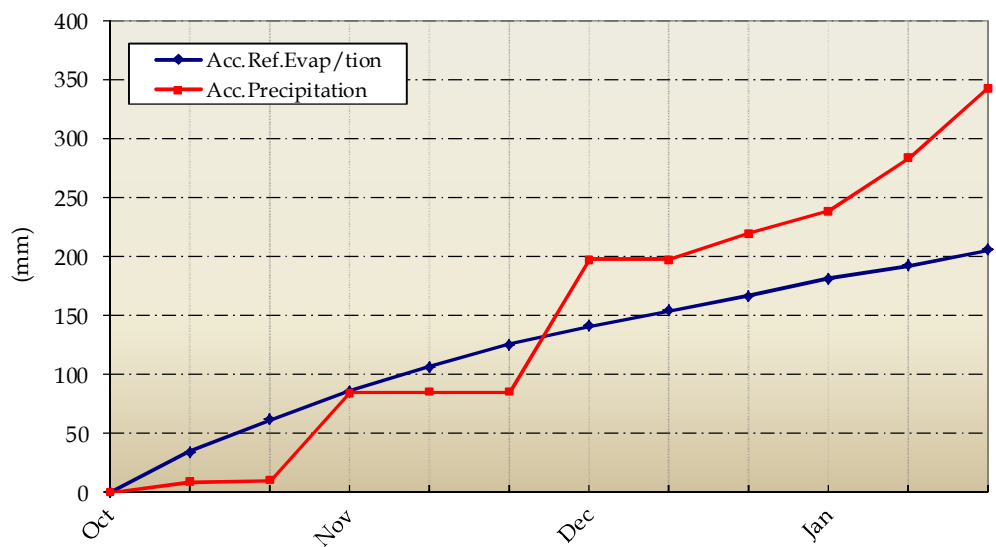
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



2nd 10-day period (11-20/01/2016)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	19.8	19.7	18.5	17.3	17.0	17.0	16.5	9.5	11.3	13.5	16.0	17.2	14.6
	Min	5.3	4.6	8.6	4.6	3.7	13.1	6.8	2.8	-0.1	4.8	5.4	5.5	4.9
Relative Humidity	Max	96	96	95	94	91	92	92	95	92	95	94	87	-
	Min	64	57	42	22	56	70	59	49	36	72	53	43	-
Soil Temperature at 10 cm	06 UTC	12.0	11.2	12.0	11.4	10.8	12.4	12.4	10.6	9.2	9.4	11.1	9.5	9.0
	12 UTC	12.4	12.4	12.6	11.8	12.0	13.2	12.2	10.6	10.2	10.0	11.7	10.2	10.1
Sunshine Duration		5.9	6.5	6.3	7.8	4.3	0.0	1.9	3.9	3.1	2.4	4.2	7.0	4.2
Precipitation				0.2	0.7		2.7	18.2	14.0	0.1	23.4	59.3	0.4	33.9
Evaporation		4.0	0.9	1.1	1.7	0.0	1.0	8.2	2.7	0.5	0.0	20.1	-	23.4
Growing Degrees	5	7.6	7.2	8.6	6.0	5.4	10.1	6.7	1.2	0.6	4.2	57.2	63.3	47.5
	10	2.6	2.2	3.6	1.0	0.4	5.1	1.7	0.0	0.0	0.0	16.3	15.7	8.1

2nd 10-day period (11-20/01/2016)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	13.2	17.7	11.1
Precipitation - Reference Evapotranspiration	46.1	-17.3	22.8
Number of Rainy Days	7.0	2.0	3.8
Number of Dry Days	2.0	6.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

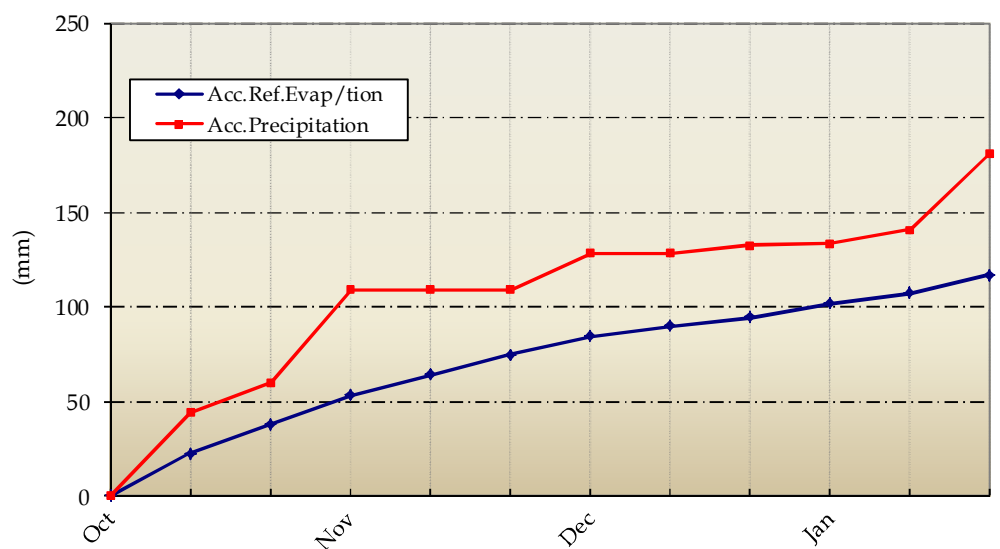


Larisa

2nd 10-day period (11-20/01/2016)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	19.5	21.5	17.6	14.6	16.1	13.4	10.8	4.2	4.6	1.8	12.4	13.2	9.3
	Min	3.0	7.3	4.5	1.8	1.5	7.2	3.0	-0.2	-4.5	-0.4	2.3	-1.0	0.0
Relative Humidity	Max	100	84	88	83	88	100	100	100	89	100	93	96	-
	Min	41	36	28	28	42	89	56	53	40	66	48	45	-
Soil Temperature at 10 cm	06 UTC	8.2	8.6	9.4	9.2	8.4	9.2	9.6	8.2	7.2	7.0	8.5	-	5.0
	12 UTC	8.2	9.2	9.6	9.0	8.4	9.2	9.4	8.2	7.0	6.4	8.5	-	5.5
Sunshine Duration		4.5	7.1	7.2	7.4	5.5	0.0	0.0	1.7	7.2	0.0	4.1	4.8	3.6
Precipitation							23.5	5.6	0.9		10.2	40.2	1.0	8.6
Evaporation		2.6	3.6	2.8	8.7	0.1	0.0	3.7	0.0	0.0	0.0	21.5	4.2	5.9
Growing Degrees	5	6.3	9.4	6.1	3.2	3.8	5.3	1.9	0.0	0.0	0.0	35.9	16.3	9.7
	10	1.3	4.4	1.1	0.0	0.0	0.3	0.0	0.0	0.0	0.0	7.0	0.0	0.4

2nd 10-day period (11-20/01/2016)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	9.7	8.0	6.4
Precipitation - Reference Evapotranspiration	30.5	-7.0	2.2
Number of Rainy Days	4.0	2.0	2.6
Number of Dry Days	8.0	7.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



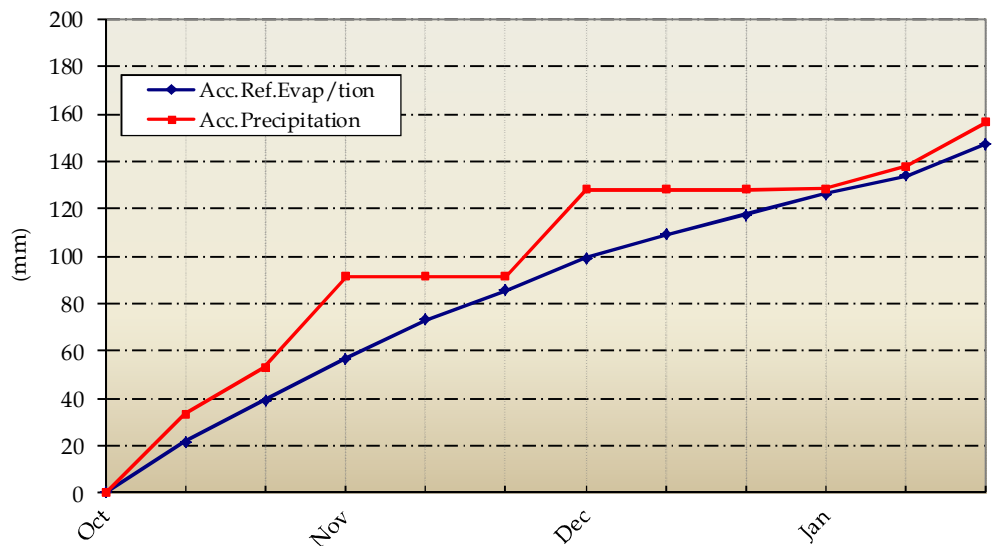


Mikra

2nd 10-day period (11-20/01/2016)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	13.8	21.2	15.2	14.0	15.8	13.9	7.6	3.2	4.2	3.8	11.3	11.7	8.8
	Min	4.6	7.0	4.6	1.0	5.3	7.4	2.8	-0.8	-1.4	-2.9	2.8	1.8	1.1
Relative Humidity	Max	97	69	91	93	80	97	90	95	80	93	88	87	-
	Min	64	36	47	37	44	78	54	49	34	65	51	57	-
Soil Temperature at 10 cm	06 UTC	7.6	8.6	8.4	7.4	8.0	9.4	7.4	7.0	2.6	2.6	6.9	4.8	4.3
	12 UTC	9.4	10.4	9.6	8.6	9.2	10.0	7.2	8.2	3.8	3.9	8.0	6.6	5.7
Sunshine Duration		4.1	4.9	6.6	8.7	4.0	0.0	2.8	1.7	8.1	0.0	4.1	5.4	3.6
Precipitation				0.0			14.1	4.0	0.6		0.0	18.7	0.5	6.6
Evaporation		0.8	1.5	1.0	0.7	0.2	0.1	0.0	0.0	0.0	0.0	4.3	13.1	10.5
Growing Degrees	5	4.2	9.1	4.9	2.5	5.6	5.7	0.2	0.0	0.0	0.0	32.1	18.0	11.4
	10	0.0	4.1	0.0	0.0	0.6	0.7	0.0	0.0	0.0	0.0	5.3	0.1	0.9

2nd 10-day period (11-20/01/2016)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	13.4	9.9	8.8
Precipitation - Reference Evapotranspiration	5.3	-9.4	-2.2
Number of Rainy Days	3.0	3.0	2.2
Number of Dry Days	8.0	13.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



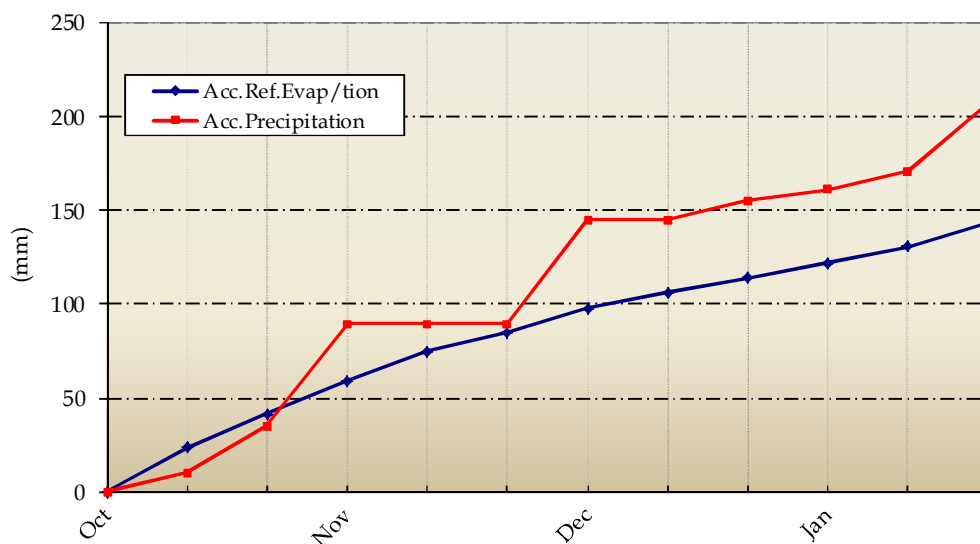


Tanagra

2nd 10-day period (11-20/01/2016)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	20.3	19.5	17.2	15.0	15.6	16.4	13.1	3.8	6.2	3.1	13.0	14.6	11.4
	Min	8.5	11.2	8.0	4.2	1.2	13.0	8.8	3.3	1.2	2.0	6.1	3.0	3.0
Relative Humidity	Max	72	55	82	82	96	95	96	92	96	100	87	94	-
	Min	27	37	34	27	40	62	51	71	51	91	49	46	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
Sunshine Duration		7.5	2.9	7.1	7.9	3.1	0.0	4.8	0.0	6.4	0.0	4.0	5.5	
Precipitation								18.9	4.5	0.0	12.6	36.0	3.5	26.0
Evaporation		5.2	5.5	4.0	3.0	3.7	3.0	1.8	1.5	1.5	0.5	29.7	11.6	
Growing Degrees	5	9.4	10.4	7.6	4.6	3.4	9.7	6.0	0.0	0.0	0.0	51.0	38.0	
	10	4.4	5.4	2.6	0.0	0.0	4.7	1.0	0.0	0.0	0.0	18.0	7.1	

2nd 10-day period (11-20/01/2016)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	12.7	11.1	
Precipitation - Reference Evapotranspiration	23.3	-7.6	26.0
Number of Rainy Days	3.0	2.0	4.7
Number of Dry Days	6.0	4.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

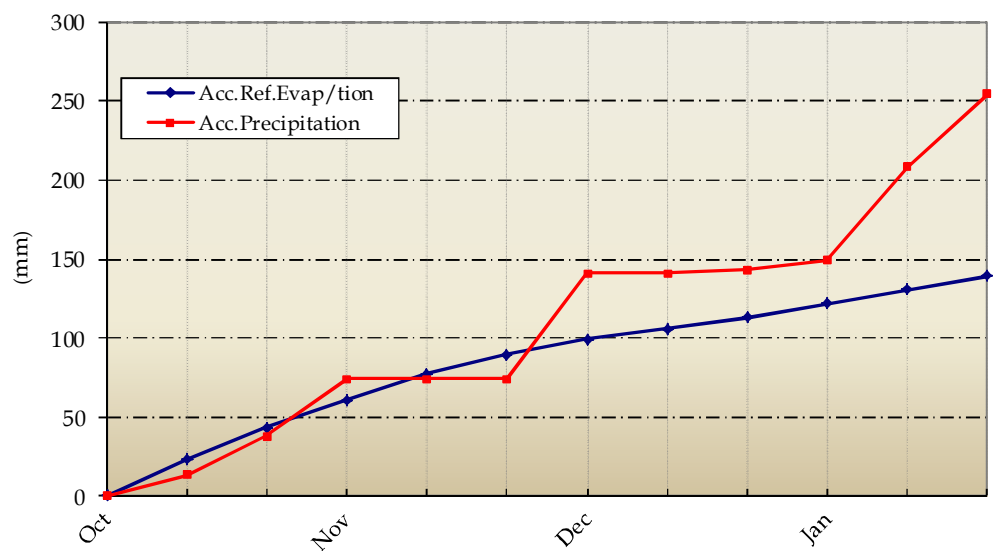


Tripoli

2nd 10-day period (11-20/01/2016)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	16.9	17.2	12.6	12.9	11.5	12.9	8.2	6.4	5.0	2.9	10.6	13.9	9.4
	Min	6.7	9.3	9.1	1.5	-1.2	8.3	3.4	-0.9	-3.8	-0.1	3.2	-0.9	0.1
Relative Humidity	Max	100	82	85	99	99	100	98	100	100	100	96	96	-
	Min	39	63	53	25	53	73	60	44	47	99	56	39	-
Soil Temperature at 10 cm	06 UTC	7.4	7.2	8.2	5.0	4.2	-	-	4.6	2.8	3.2	5.3	3.5	4.3
	12 UTC	11.0	-	9.2	8.2	7.8	-	-	6.2	5.2	3.0	7.2	6.2	5.0
Sunshine Duration		6.4	6.8	6.3	7.9	4.0	-	3.6	4.6	2.7	0.0	4.7	6.1	4.1
Precipitation				1.4	0.2		9.3	16.8		0.0	18.6	46.3	0.7	31.6
Evaporation		2.9	1.2	1.2	0.3	-	-	-	0.0	0.0	0.1	-	-	5.6
Growing Degrees	5	6.8	8.3	5.9	2.2	0.2	5.6	0.8	0.0	0.0	0.0	29.7	16.8	10.8
	10	1.8	3.3	0.9	0.0	0.0	0.6	0.0	0.0	0.0	0.0	6.5	0.0	0.5

2nd 10-day period (11-20/01/2016)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	8.5	11.2	8.5
Precipitation - Reference Evapotranspiration	37.8	-10.5	23.1
Number of Rainy Days	5.0	1.0	3.7
Number of Dry Days	2.0	6.0	-

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



ΕΘΝΙΚΗ  
ΜΕΤΕΩΡΟΛΟΓΙΚΗ  
ΥΠΗΡΕΣΙΑ

HELLENIC NATIONAL METEOROLOGICAL SERVICE

Division of Climatology-Applications

Issue Editors :

Papakrivou Anastasia

The present bulletin was designed and implemented under the support of Water Resources Management Division of Agriculture University of Athens