



AGROMETEOROLOGICAL BULLETIN

November 2016
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



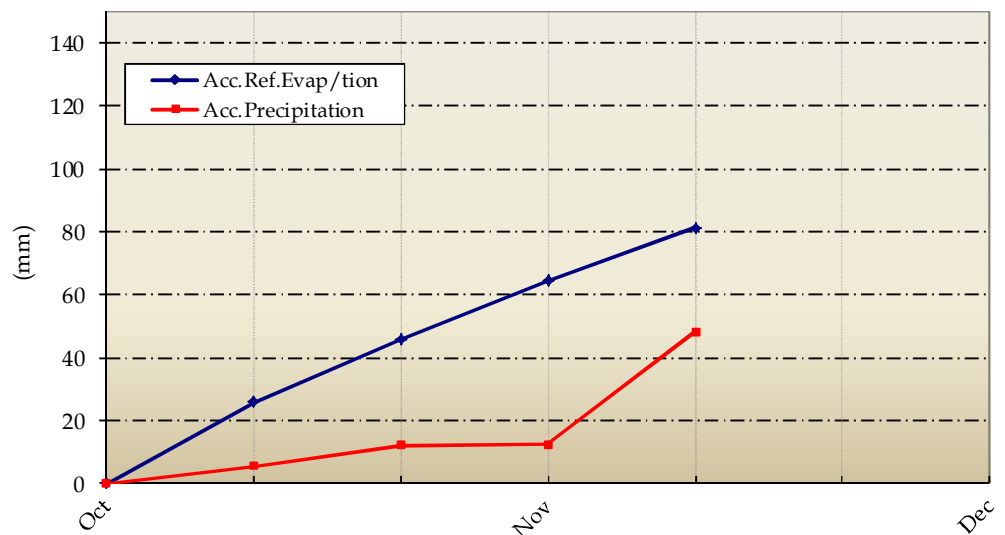
Hellenic National Meteorological Service
Division of Climatology-Applications
El. Venizelou Street 14, 16777
Helliniko, Athens

Web addresses of HNMS
www.hnms.gr
www.emy.gov.gr
www.meteo.gov.gr
www.meteohellas.gr

1st 10-day period (1-10/11/2016)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	16.2	15.4	20.2	15.4	16.6	21.0	21.2	22.6	21.8	18.8	18.9	18.0	15.8
	Min	0.0	0.2	10.4	10.8	9.8	8.4	16.8	19.0	15.2	10.6	10.1	5.8	7.1
Relative Humidity	Max	76	82	86	80	94	93	90	88	94	95	88	90	-
	Min	22	49	57	52	68	71	73	58	65	49	56	46	-
Soil Temperature at 10 cm	06 UTC	11.0	10.2	14.4	15.4	14.2	14.2	17.6	18.8	18.5	15.2	15.0	10.7	11.0
	12 UTC	16.0	14.0	17.6	15.6	16.6	18.0	20.0	20.4	19.6	18.4	17.6	13.8	12.9
Sunshine Duration		8.1	1.1	7.8	0.7	3.5	3.8	6.7	1.7	0.0	8.4	4.2	7.9	4.1
Precipitation					0.9	0.2		0.0	0.3	15.5	19.0	35.9		19.0
Evaporation		3.7	2.5	3.3	1.3	2.3	1.2	2.5	4.5	5.3	2.6	29.2	23.3	25.4
Growing Degrees	5	3.1	2.8	10.3	8.1	8.2	9.7	14.0	15.8	13.5	9.7	95.2	68.8	64.9
	10	0.0	0.0	5.3	3.1	3.2	4.7	9.0	10.8	8.5	4.7	49.3	18.8	23.3

1st 10-day period (1-10/11/2016)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	16.7	13.0	14.9
Precipitation - Reference Evapotranspiration	19.2	-13.0	4.1
Number of Rainy Days	5.0	0.0	1.9
Number of Dry Days	12.0	17.0	-

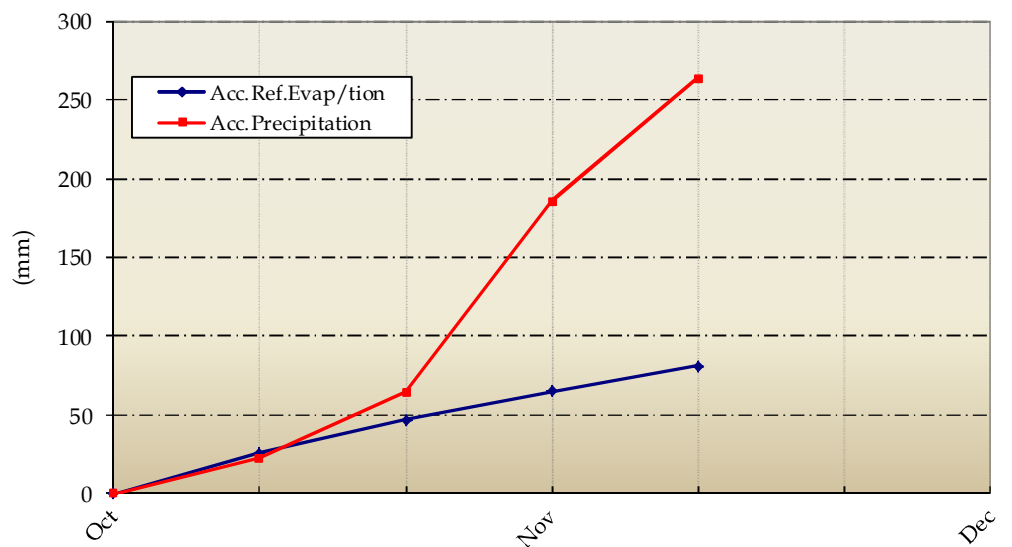
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



1st 10-day period (1-10/11/2016)		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	20.4	21.6	21.8	22.4	22.2	23.0	22.8	22.0	20.3	21.6	21.3	20.0
	Min	10.3	6.6	11.0	13.8	13.6	13.8	17.5	21.0	14.6	11.5	13.4	7.2	10.4
Relative Humidity	Max	88	89	90	93	89	89	79	76	92	88	87	89	-
	Min	37	52	52	56	58	57	63	51	38	56	52	39	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	14.3
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	16.6
Sunshine Duration		7.7	5.0	8.8	5.0	6.6	4.1	0.4	2.1	0.0	6.1	4.6	7.5	6.0
Precipitation					64.3				1.7	12.2		78.2		45.1
Evaporation		0.7	3.0	1.0	4.3	2.0	1.0	2.0	11.0	9.0	0.0	34.0	18.0	25.9
Growing Degrees	5	9.8	8.5	11.3	12.8	13.0	13.0	15.3	16.9	13.3	10.9	124.7	92.2	101.6
	10	4.8	3.5	6.3	7.8	8.0	8.0	10.3	11.9	8.3	5.9	74.7	42.2	52.1

1st 10-day period (1-10/11/2016)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	16.4	14.8	14.3
Precipitation - Reference Evapotranspiration	61.8	-14.8	30.8
Number of Rainy Days	3.0	0.0	3.2
Number of Dry Days	4.0	18.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

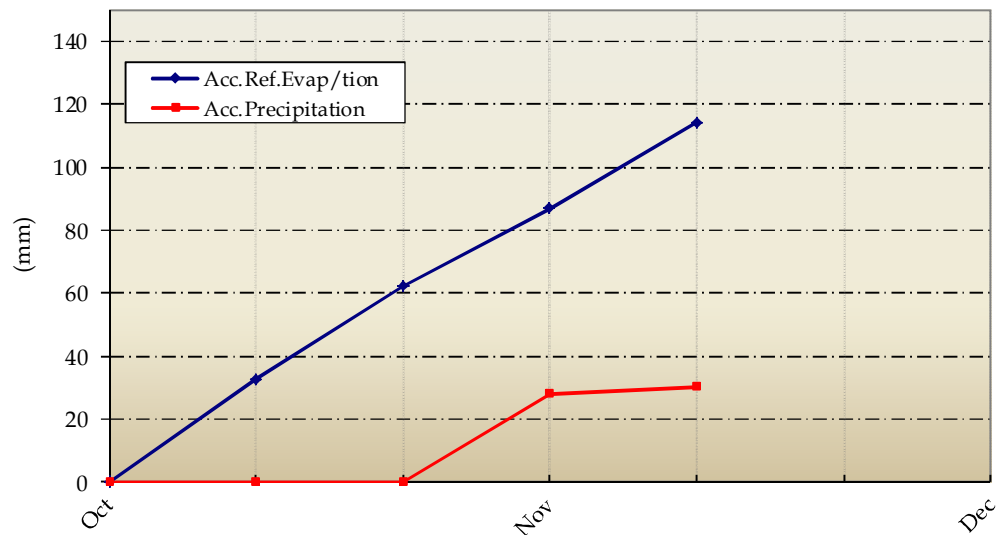


Iraklio

1st 10-day period (1-10/11/2016)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	18.2	18.4	20.8	22.6	23.0	22.2	26.6	28.6	26.6	22.2	22.9	19.8	20.4
	Min	15.0	14.2	9.6	14.8	15.0	14.0	16.0	21.0	22.0	13.0	15.5	15.4	14.3
Relative Humidity	Max	64	78	82	80	89	90	89	74	91	79	82	80	-
	Min	51	48	46	52	62	64	44	37	45	48	50	60	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
Sunshine Duration		2.7	8.7	8.1	7.8	7.9	7.9	7.0	7.2	7.2	8.0	7.2	5.7	5.0
Precipitation										1.5	0.6	2.1		20.0
Evaporation		3.3	5.6	1.1	2.8	2.0	0.9	4.2	8.6	4.6	3.2	36.3	26.5	39.9
Growing Degrees	5	11.6	11.3	10.2	13.7	14.0	13.1	16.3	19.8	19.3	12.6	141.9	126.0	123.4
	10	6.6	6.3	5.2	8.7	9.0	8.1	11.3	14.8	14.3	7.6	91.9	76.0	73.4

1st 10-day period (1-10/11/2016)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	27.2	21.7	-
Precipitation - Reference Evapotranspiration	-25.1	-21.7	20.0
Number of Rainy Days	2.0	0.0	2.6
Number of Dry Days	8.0	17.0	-

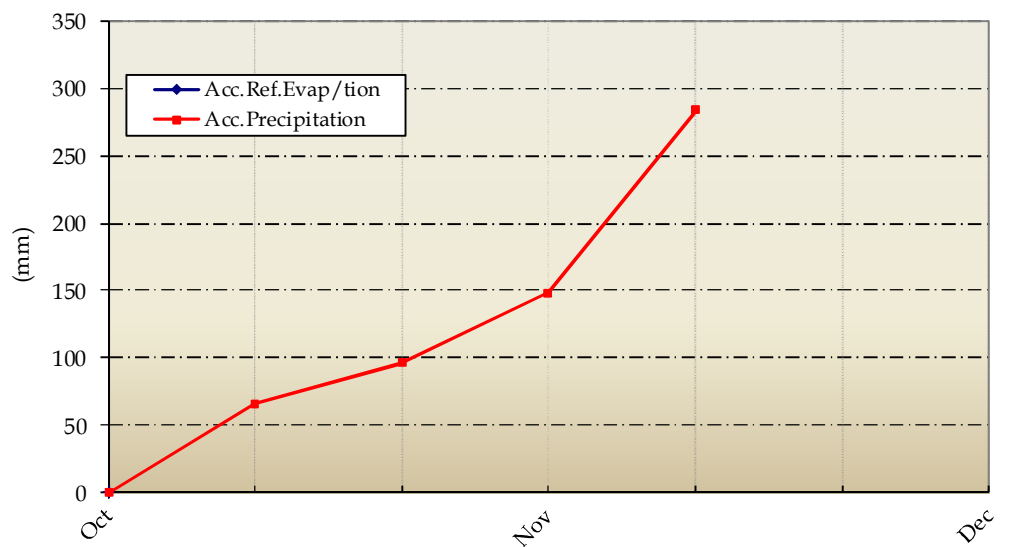
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



1st 10-day period (1-10/11/2016)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	17.2	16.3	14.7	19.0	19.4	18.2	18.5	21.0	15.4	12.3	17.2	19.7	16.0
	Min	-1.0	-1.1	4.0	9.9	9.6	6.9	13.5	15.3	9.8	4.2	7.1	0.3	5.4
Relative Humidity	Max	100	100	100	100	100	100	100	100	100	100	100	92	-
	Min	27	51	-	63	49	68	82	59	94	-	62	32	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	10.0
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	11.8
Sunshine Duration		7.9	7.2	-	2.4	-	2.5	0.0	0.0	0.0	-	2.9	5.9	4.1
Precipitation				0.7	0.2			5.8	12.4	110.3	6.4	135.8	0.0	40.1
Evaporation		-	-	-	-	-	-	-	-	-	-	-	-	16.8
Growing Degrees	5	3.1	2.6	4.4	9.5	9.5	7.6	11.0	13.2	7.6	3.3	71.6	50.1	57.3
	10	0.0	0.0	0.0	4.5	4.5	2.6	6.0	8.2	2.6	0.0	28.3	5.4	16.4

1st 10-day period (1-10/11/2016)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	-	-	10.7
Precipitation - Reference Evapotranspiration	-	-	29.4
Number of Rainy Days	6.0	0.0	3.4
Number of Dry Days	9.0	19.0	-

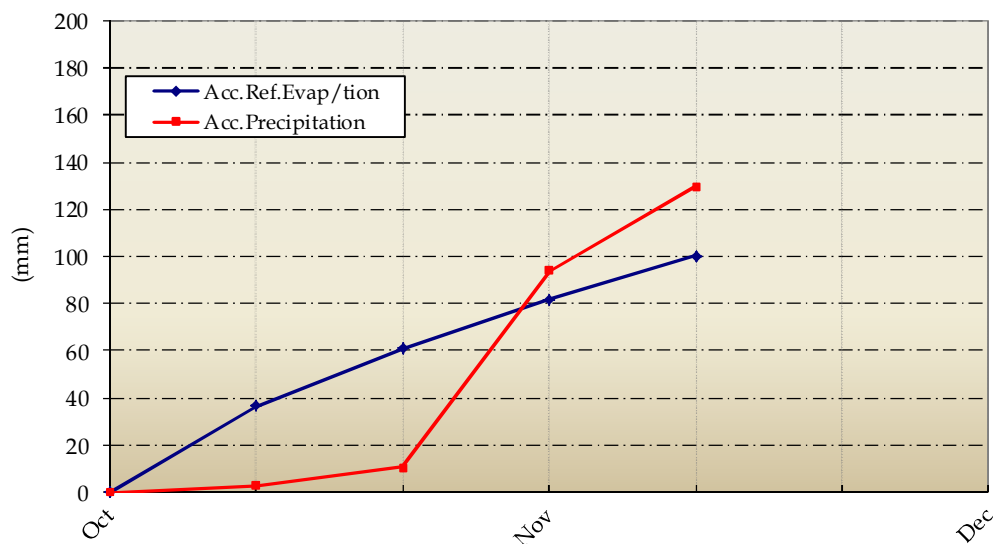
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



1st 10-day period (1-10/11/2016)		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	21.9	24.0	20.9	25.5	22.6	23.2	25.0	20.4	21.9	22.5	22.6	21.0
	Min	12.5	9.2	11.5	12.4	9.8	9.7	13.2	21.4	18.5	10.6	12.9	8.0	10.2
Relative Humidity	Max	92	91	92	94	94	94	94	78	93	94	92	86	-
	Min	50	52	45	66	39	51	62	59	62	55	54	35	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	16.1	15.1
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	16.8	16.9
Sunshine Duration		5.7	8.0	8.7	3.9	7.8	7.0	1.3	2.2	0.5	7.1	5.2	7.7	5.6
Precipitation					19.4				0.0	10.5	5.5	35.4	0.7	35.3
Evaporation		3.1	2.9	1.5	0.5	1.4	2.2	3.2	2.2	1.9	2.5	21.4	29.6	30.4
Growing Degrees	5	11.0	10.6	12.8	11.7	12.7	11.2	13.2	18.2	14.5	11.3	126.8	103.4	105.8
	10	6.0	5.6	7.8	6.7	7.7	6.2	8.2	13.2	9.5	6.3	76.8	53.4	55.9

1st 10-day period (1-10/11/2016)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	18.5	20.9	16.4
Precipitation - Reference Evapotranspiration	16.9	-20.2	18.9
Number of Rainy Days	3.0	1.0	3.1
Number of Dry Days	3.0	0.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

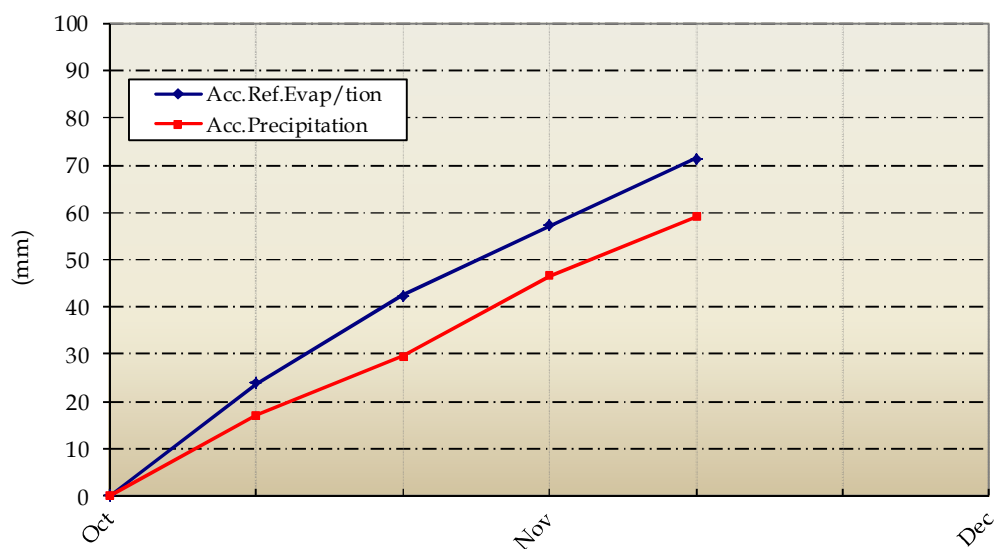


Larisa

1st 10-day period (1-10/11/2016)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	17.3	18.4	19.7	21.6	21.2	22.6	26.2	25.0	18.0	18.9	20.9	20.2	17.2
	Min	1.4	1.5	2.7	8.6	13.4	7.6	10.8	13.6	12.4	6.6	7.9	3.1	6.7
Relative Humidity	Max	96	100	100	99	100	100	96	100	100	100	99	99	-
	Min	27	31	43	47	51	45	39	42	75	39	44	35	-
Soil Temperature at 10 cm	06 UTC	16.2	15.6	14.0	15.2	16.2	16.2	16.6	17.0	17.0	16.2	16.0	13.7	12.3
	12 UTC	16.2	15.4	15.0	15.4	16.4	16.8	16.6	17.0	17.0	16.2	16.2	13.8	13.2
Sunshine Duration		6.6	6.6	5.1	6.6	6.7	5.8	4.2	0.5	0.0	4.8	4.7	6.3	4.1
Precipitation									1.4	11.0		12.4		20.6
Evaporation		2.7	2.9	1.5	2.5	2.9	1.8	3.6	1.1	2.8	0.7	22.5	18.8	17.6
Growing Degrees	5	4.4	5.0	6.2	10.1	12.3	10.1	13.5	14.3	10.2	7.8	93.8	66.5	69.6
	10	0.0	0.0	1.2	5.1	7.3	5.1	8.5	9.3	5.2	2.8	44.5	16.5	25.7

1st 10-day period (1-10/11/2016)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	14.1	11.1	11.7
Precipitation - Reference Evapotranspiration	-1.7	-11.1	8.9
Number of Rainy Days	2.0	0.0	2.7
Number of Dry Days	9.0	17.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

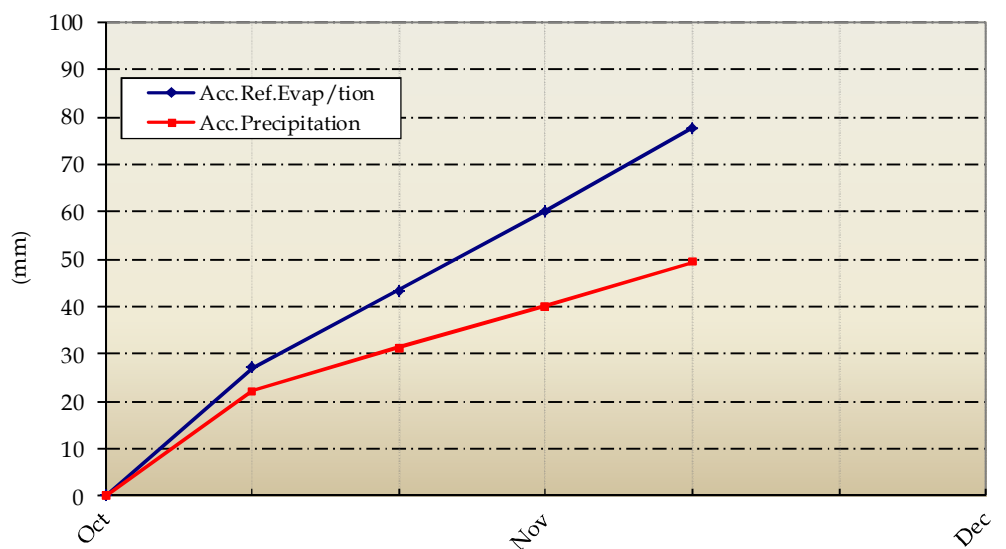


Mikra

1st 10-day period (1-10/11/2016)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	16.8	17.8	18.2	19.0	18.8	20.9	25.2	24.6	21.8	18.4	20.2	19.4	16.5
	Min	3.6	4.6	4.8	7.7	13.4	12.0	11.4	20.4	11.6	6.4	9.6	5.6	7.9
Relative Humidity	Max	66	83	93	93	96	95	88	65	97	97	87	87	-
	Min	26	38	59	47	67	53	38	41	52	34	46	42	-
Soil Temperature at 10 cm	06 UTC	11.0	11.2	11.6	12.8	15.2	15.4	15.8	17.8	17.8	13.2	14.2	11.4	11.5
	12 UTC	13.2	13.8	14.2	15.0	15.3	15.5	15.5	18.8	17.0	14.5	15.3	13.6	13.8
Sunshine Duration		8.8	8.7	8.3	5.0	6.3	5.6	6.6	1.5	0.7	6.2	5.8	8.2	4.0
Precipitation						0.7			0.0	8.6		9.3		18.1
Evaporation		6.5	2.3	2.6	4.7	0.4	3.1	4.5	7.5	0.3	4.3	36.2	21.4	22.5
Growing Degrees	5	5.2	6.2	6.5	8.4	11.1	11.5	13.3	17.5	11.7	7.4	98.7	74.8	72.4
	10	0.2	1.2	1.5	3.4	6.1	6.5	8.3	12.5	6.7	2.4	48.7	24.8	27.9

1st 10-day period (1-10/11/2016)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	17.6	16.3	13.6
Precipitation - Reference Evapotranspiration	-8.3	-16.3	4.5
Number of Rainy Days	2.0	0.0	2.5
Number of Dry Days	7.0	17.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

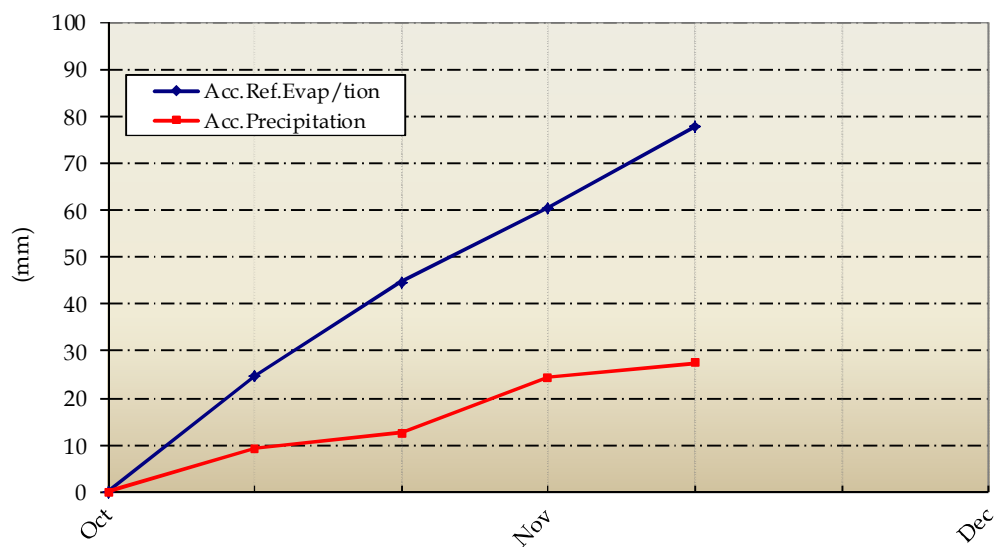


Tanagra

1st 10-day period (1-10/11/2016)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	16.8	19.8	24.2	23.0	21.6	23.3	22.9	27.6	25.1	20.1	22.4	19.3	19.0
	Min	7.2	3.8	5.6	11.4	8.5	9.6	17.0	21.0	17.4	11.2	11.3	7.6	9.1
Relative Humidity	Max	74	94	97	99	100	98	69	79	89	71	87	85	-
	Min	24	31	26	39	50	32	51	39	43	35	37	39	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
Sunshine Duration		8.6	8.3	8.5	2.8	7.7	7.8	0.0	4.2	4.3	8.1	6.0	7.0	
Precipitation										3.2		3.2		19.6
Evaporation		-	-	-	-	-	-	-	-	-	-	-	33.5	
Growing Degrees	5	7.0	6.8	9.9	12.2	10.1	11.5	15.0	19.3	16.3	10.7	118.6	84.2	
	10	2.0	1.8	4.9	7.2	5.1	6.5	10.0	14.3	11.3	5.7	68.6	34.2	

1st 10-day period (1-10/11/2016)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	17.4	15.5	
Precipitation - Reference Evapotranspiration	-14.2	-15.5	19.6
Number of Rainy Days	1.0	0.0	3.1
Number of Dry Days	11.0	17.0	-

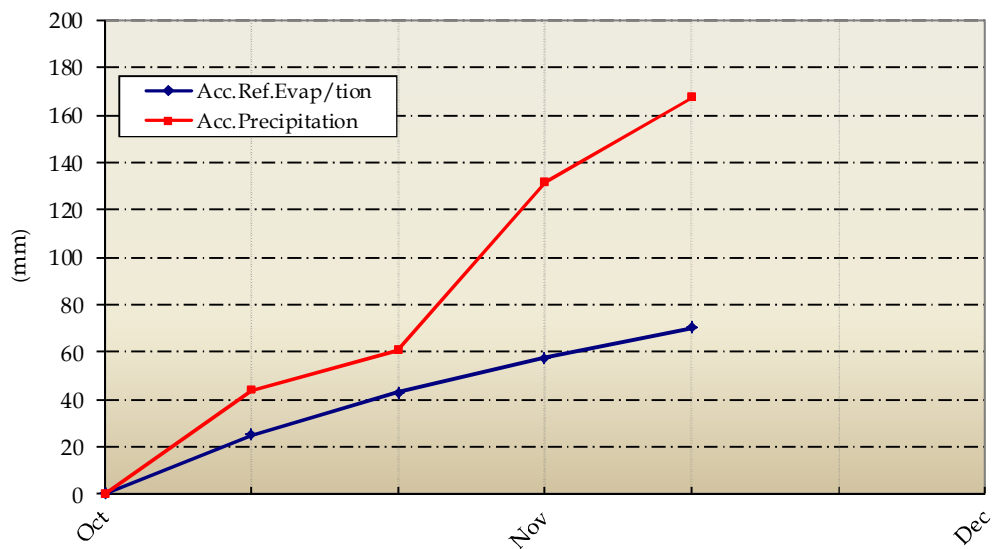
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



1st 10-day period (1-10/11/2016)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	15.5	18.7	18.8	17.6	21.2	18.4	19.8	21.3	17.0	15.4	18.4	19.3	16.5
	Min	4.9	1.2	3.8	7.3	4.3	3.6	12.9	13.4	9.4	7.4	6.8	0.9	5.2
Relative Humidity	Max	100	100	100	100	100	100	98	100	100	100	100	97	-
	Min	47	45	48	59	44	55	65	59	63	60	54	28	-
Soil Temperature at 10 cm	06 UTC	11.8	10.2	10.2	11.4	10.8	10.8	13.2	14.0	14.6	11.2	11.8	9.2	11.0
	12 UTC	14.6	13.4	13.6	13.0	-	-	15.6	-	15.4	13.4	14.1	12.1	12.3
Sunshine Duration		9.5	7.7	9.1	3.9	7.4	6.4	4.2	3.5	1.5	5.8	5.9	7.8	5.1
Precipitation					7.8				0.3	27.1	0.8	36.0	0.0	28.3
Evaporation		1.5	1.1	1.4	8.1	1.1	1.4	0.7	1.8	2.4	1.1	20.6	-	18.0
Growing Degrees	5	5.2	5.0	6.3	7.5	7.8	6.0	11.4	12.4	8.2	6.4	76.0	-	58.6
	10	0.2	0.0	1.3	2.5	2.8	1.0	6.4	7.4	3.2	1.4	26.0	-	17.0

1st 10-day period (1-10/11/2016)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	12.8	16.4	13.6
Precipitation - Reference Evapotranspiration	23.2	-16.4	14.7
Number of Rainy Days	4.0	0.0	2.6
Number of Dry Days	4.0	18.0	-

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

© 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