



AGROMETEOROLOGICAL BULLETIN

*October 2016
3rd 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



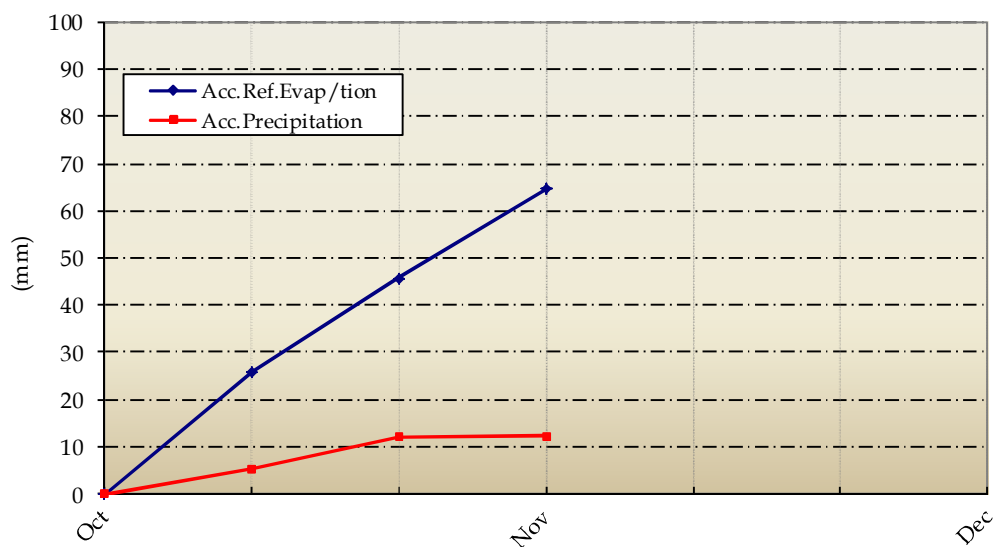
Hellenic National Meteorological Service
Division of Climatology-Applications
El. Venizelou Street 14, 16777
Helliniko, Athens

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

3rd 10-day period (21-31/10/2016)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	20.2	19.0	22.8	21.6	18.4	18.6	17.4	13.0	16.0	18.0	17.4	18.4	16.8	17.4
	Min	13.0	9.8	9.6	14.0	12.6	8.0	11.6	9.0	6.6	3.2	7.6	9.5	8.8	8.0
Relative Humidity	Max	84	93	95	89	89	89	74	67	78	84	61	82	87	-
	Min	42	71	59	55	42	57	46	54	46	45	26	49	50	-
Soil Temperature at 10 cm	06 UTC	16.0	16.0	15.7	17.4	16.6	15.2	16.8	14.8	13.4	12.0	14.6	15.3	12.7	12.7
	12 UTC	20.0	19.4	21.0	21.0	20.4	19.0	19.4	16.0	17.2	17.0	18.2	19.0	14.8	15.2
Sunshine Duration		6.9	1.1	6.9	7.7	8.4	4.6	6.7	0.0	9.4	5.8	6.9	5.9	5.0	5.2
Precipitation			0.1						0.0				0.1	37.2	22.3
Evaporation		3.5	2.1	4.1	7.6	1.1	1.3	5.9	2.3	4.5	3.7	7.3	43.4	30.7	41.1
Growing Degrees	5	11.6	9.4	11.2	12.8	10.5	8.3	9.5	6.0	6.3	5.6	7.5	98.7	86.0	85.3
	10	6.6	4.4	6.2	7.8	5.5	3.3	4.5	1.0	1.3	0.6	2.5	43.7	31.0	34.4

3rd 10-day period (21-31/10/2016)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	18.9	20.2	20.4
Precipitation - Reference Evapotranspiration	-18.8	17.0	1.9
Number of Rainy Days	1.0	4.0	2.2
Number of Dry Days	4.0	7.0	-

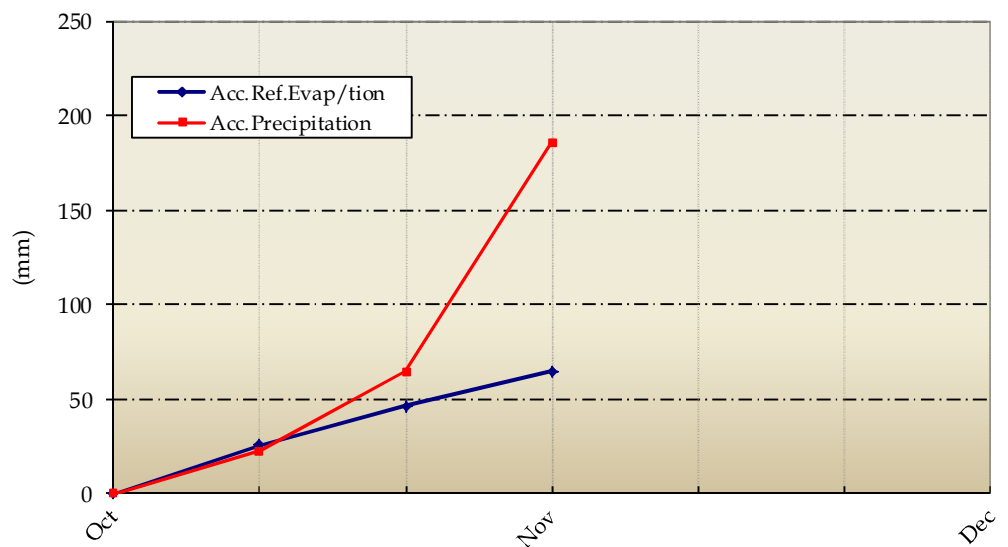
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



3rd 10-day period (21-31/10/2016)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	20.0	20.7	24.1	25.6	24.6	24.4	18.4	18.1	20.6	22.0	20.9	21.8	21.6	21.5
	Min	16.0	16.2	12.4	14.9	11.6	9.8	15.3	14.0	13.0	12.9	13.3	13.6	11.7	11.4
Relative Humidity	Max	92	93	93	92	86	89	91	92	90	88	82	90	89	-
	Min	78	74	59	49	43	42	83	64	55	62	47	60	46	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-	16.1
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-	18.7
Sunshine Duration		0.0	0.0	7.0	8.9	8.9	7.8	0.0	0.0	5.2	2.1	6.0	4.2	5.6	6.3
Precipitation		39.1	53.8					6.8	15.2	4.0	2.3		121.2	145.5	50.1
Evaporation		4.7	6.6	9.0	3.0	1.0	5.0	3.2	0.8	5.0	1.0	4.3	43.6	31.0	31.6
Growing Degrees	5	13.0	13.5	13.3	15.3	13.1	12.1	11.9	11.1	11.8	12.5	12.1	139.4	128.1	126.2
	10	8.0	8.5	8.3	10.3	8.1	7.1	6.9	6.1	6.8	7.5	7.1	84.4	73.1	71.3

3rd 10-day period (21-31/10/2016)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	18.3	22.1	18.7
Precipitation - Reference Evapotranspiration	102.9	123.4	31.4
Number of Rainy Days	6.0	3.0	3.7
Number of Dry Days	8.0	9.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

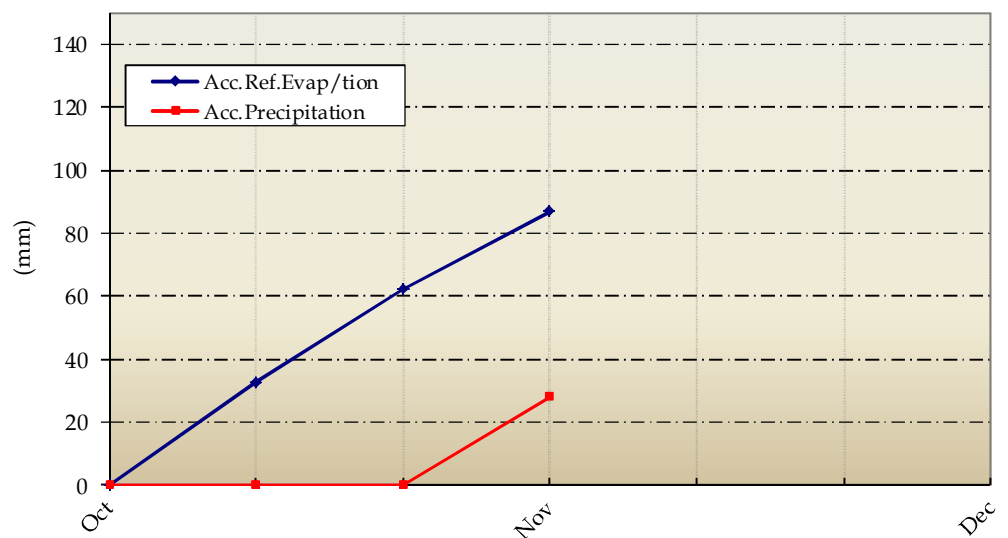


Iraklio

3rd 10-day period (21-31/10/2016)		21	22	23	24	25	26	27	28	29	30	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	22.4	24.8	25.6	23.4	22.0	21.0	22.2	21.6	19.4	21.0	18.4	22.0	21.3	21.6
	Min	18.0	18.0	19.0	20.4	19.6	18.6	18.4	18.4	18.4	16.0	16.0	18.3	17.8	15.6
Relative Humidity	Max	80	85	90	87	81	76	81	86	85	87	93	85	78	-
	Min	63	67	57	64	55	63	63	60	71	63	60	62	60	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sunshine Duration		8.0	8.6	8.2	7.9	6.4	5.4	0.9	1.4	0.0	4.6	0.0	4.7	2.6	5.7
Precipitation										0.6		27.4	28.0	29.2	29.2
Evaporation		3.1	3.4	1.3	3.3	5.6	3.2	3.0	3.4	1.1	0.0	2.0	29.4	30.1	48.8
Growing Degrees	5	15.2	16.4	17.3	16.9	15.8	14.8	15.3	15.0	13.9	13.5	12.2	166.3	159.9	149.6
	10	10.2	11.4	12.3	11.9	10.8	9.8	10.3	10.0	8.9	8.5	7.2	111.3	104.9	94.6

3rd 10-day period (21-31/10/2016)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	24.9	26.8	-
Precipitation - Reference Evapotranspiration	3.1	2.4	29.2
Number of Rainy Days	2.0	2.0	3.0
Number of Dry Days	35.0	22.0	-

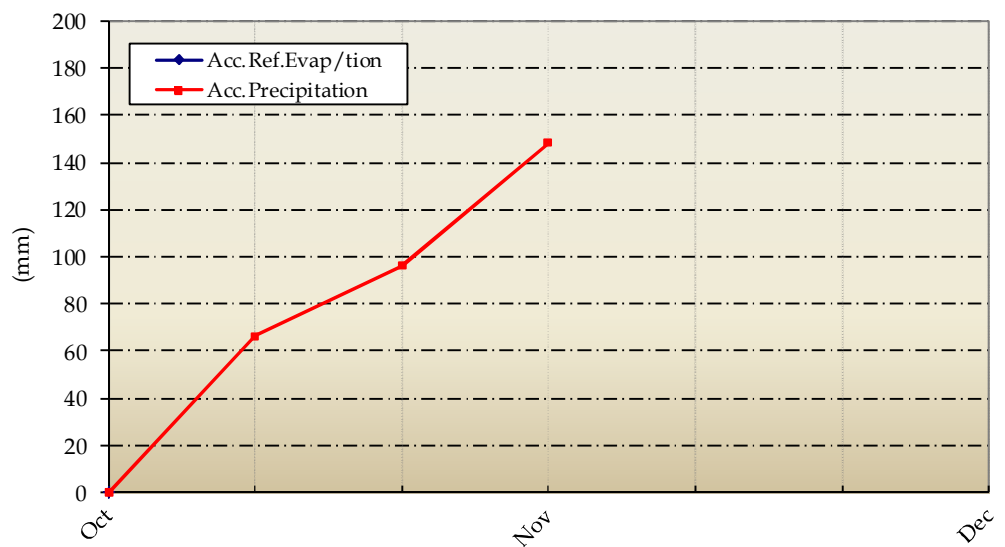
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



3rd 10-day period (21-31/10/2016)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	18.6	20.2	22.2	19.1	24.1	21.6	19.7	16.6	19.0	18.9	17.0	19.7	18.6	17.6
	Min	13.3	13.1	13.0	10.8	5.7	9.2	12.0	12.4	10.1	7.7	6.6	10.4	6.7	7.0
Relative Humidity	Max	100	100	100	100	100	100	100	82	100	93	99	98	96	-
	Min	73	77	56	79	59	67	58	50	-	62	29	61	50	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-	11.9
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-	13.8
Sunshine Duration		1.2	5.0	4.7	4.2	6.6	3.1	0.0	0.5	-	4.8	9.3	3.9	4.7	4.6
Precipitation		1.1	40.6	1.3	9.2								52.2	37.5	37.6
Evaporation		-	-	-	-	-	-	-	-	-	-	-	-	-	18.9
Growing Degrees	5	11.0	11.7	12.6	10.0	9.9	10.4	10.9	9.5	9.6	8.3	6.8	110.5	84.2	81.3
	10	6.0	6.7	7.6	5.0	4.9	5.4	5.9	4.5	4.6	3.3	1.8	55.5	30.1	30.0

3rd 10-day period (21-31/10/2016)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	-	-	14.7
Precipitation - Reference Evapotranspiration	-	-	22.9
Number of Rainy Days	4.0	2.0	3.8
Number of Dry Days	1.0	2.0	-

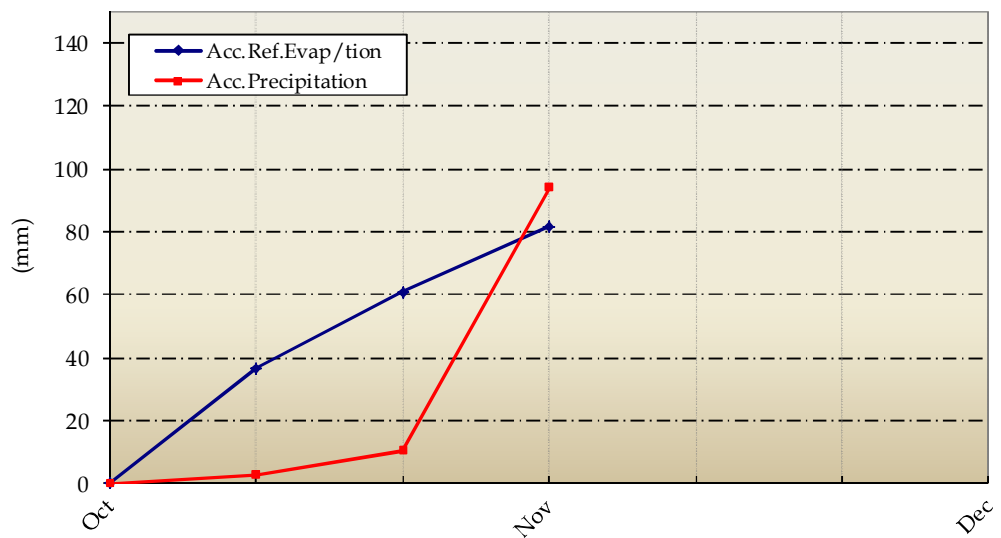
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



3rd 10-day period (21-31/10/2016)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	21.0	24.4	26.5	26.2	25.6	26.2	21.9	18.6	21.0	22.2	22.2	23.3	22.6	22.3
	Min	16.2	14.8	15.0	15.8	14.1	11.0	14.8	14.3	14.0	13.4	14.7	14.4	13.3	11.5
Relative Humidity	Max	93	94	92	93	84	88	94	93	87	90	93	91	84	-
	Min	72	63	53	50	36	34	68	58	64	64	53	56	45	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	19.2	16.7
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	19.7	18.5
Sunshine Duration		0.0	3.2	7.6	9.6	10.1	9.2	0.1	0.0	2.9	0.5	4.0	4.3	5.0	5.9
Precipitation		11.2	6.7	0.7				18.0	27.6	2.2	0.1	17.2	83.7	73.8	43.6
Evaporation		0.0	2.1	3.4	4.9	5.2	3.2	2.6	4.4	1.2	0.2	4.1	31.3	-	36.3
Growing Degrees	5	13.6	14.6	15.8	16.0	14.9	13.6	13.4	11.5	12.5	12.8	13.5	152.0	142.9	130.7
	10	8.6	9.6	10.8	11.0	9.9	8.6	8.4	6.5	7.5	7.8	8.5	97.0	87.9	75.7

3rd 10-day period (21-31/10/2016)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	21.0	24.4	21.6
Precipitation - Reference Evapotranspiration	62.7	49.4	22.0
Number of Rainy Days	8.0	5.0	3.7
Number of Dry Days	0.0	9.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

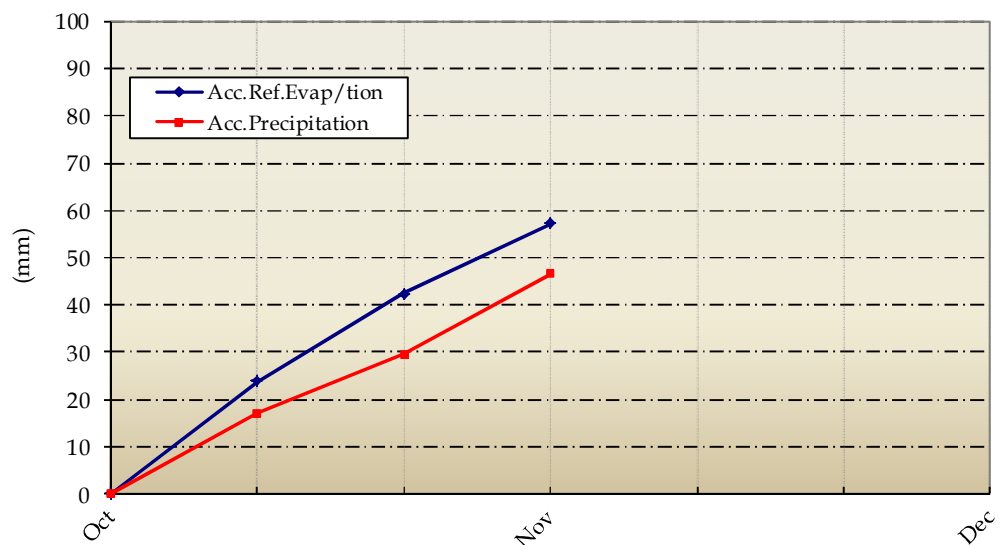


Larisa

3rd 10-day period (21-31/10/2016)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	17.2	18.2	22.4	22.2	20.6	21.0	16.6	15.2	16.4	18.3	16.7	18.6	17.4	18.9
	Min	13.8	14.2	14.4	15.8	13.6	14.0	14.8	12.6	10.8	7.0	11.3	12.9	10.5	8.3
Relative Humidity	Max	100	100	100	100	100	100	100	83	100	100	72	96	95	-
	Min	73	86	58	63	62	60	73	53	58	38	30	59	57	-
Soil Temperature at 10 cm	06 UTC	18.6	18.4	18.0	19.2	19.0	19.2	19.0	18.2	17.6	18.4	17.0	18.4	17.7	14.6
	12 UTC	18.2	18.4	18.8	19.2	19.0	18.0	18.8	18.0	18.0	17.2	18.0	18.3	17.5	15.6
Sunshine Duration		0.0	0.0	5.4	3.4	3.7	2.4	0.0	0.0	1.8	4.7	6.0	2.5	2.6	4.4
Precipitation			17.0					0.0	0.0	0.1			17.1	49.5	23.9
Evaporation		0.6	0.5	1.9	1.7	3.5	2.0	0.6	1.5	2.4	3.0	3.3	21.0	18.1	24.8
Growing Degrees	5	10.5	11.2	13.4	14.0	12.1	12.5	10.7	8.9	8.6	7.7	9.0	118.6	98.5	94.1
	10	5.5	6.2	8.4	9.0	7.1	7.5	5.7	3.9	3.6	2.7	4.0	63.6	43.5	41.5

3rd 10-day period (21-31/10/2016)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	14.8	14.9	16.4
Precipitation - Reference Evapotranspiration	2.3	34.6	7.5
Number of Rainy Days	2.0	4.0	3.5
Number of Dry Days	4.0	4.0	-

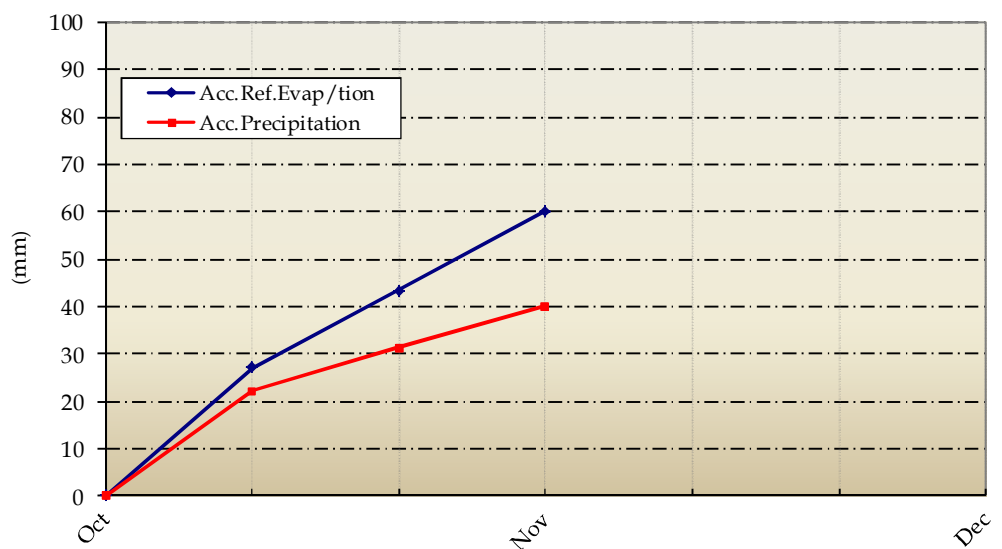
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



3rd 10-day period (21-31/10/2016)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	16.8	18.2	20.6	21.2	20.3	19.0	17.8	16.0	16.8	18.6	16.3	18.3	17.8	18.1
	Min	13.0	14.8	15.4	12.6	14.4	14.8	14.6	11.4	6.7	5.8	10.6	12.2	10.0	9.2
Relative Humidity	Max	93	96	97	96	94	93	93	77	84	58	60	86	91	-
	Min	74	70	63	62	63	65	60	41	34	32	27	54	56	-
Soil Temperature at 10 cm	06 UTC	16.2	16.4	16.4	16.8	18.0	17.8	17.2	15.9	13.0	13.2	12.0	15.7	14.5	13.8
	12 UTC	17.0	17.0	17.0	17.4	17.8	18.4	17.8	17.0	15.6	15.0	14.6	16.8	16.0	16.0
Sunshine Duration		0.0	0.0	4.0	6.5	1.8	0.1	0.0	1.0	8.8	8.7	8.6	3.6	4.2	4.6
Precipitation			8.6						0.1				8.7	38.1	21.1
Evaporation		0.7	1.3	1.7	1.9	3.4	2.1	1.1	1.4	3.3	3.0	4.8	24.7	36.6	29.7
Growing Degrees	5	9.9	11.5	13.0	11.9	12.4	11.9	11.2	8.7	6.8	7.2	8.5	112.9	98.0	95.5
	10	4.9	6.5	8.0	6.9	7.4	6.9	6.2	3.7	1.8	2.2	3.5	57.9	43.0	42.9

3rd 10-day period (21-31/10/2016)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	16.8	17.6	17.3
Precipitation - Reference Evapotranspiration	-8.1	20.5	3.8
Number of Rainy Days	2.0	4.0	3.2
Number of Dry Days	9.0	4.0	-

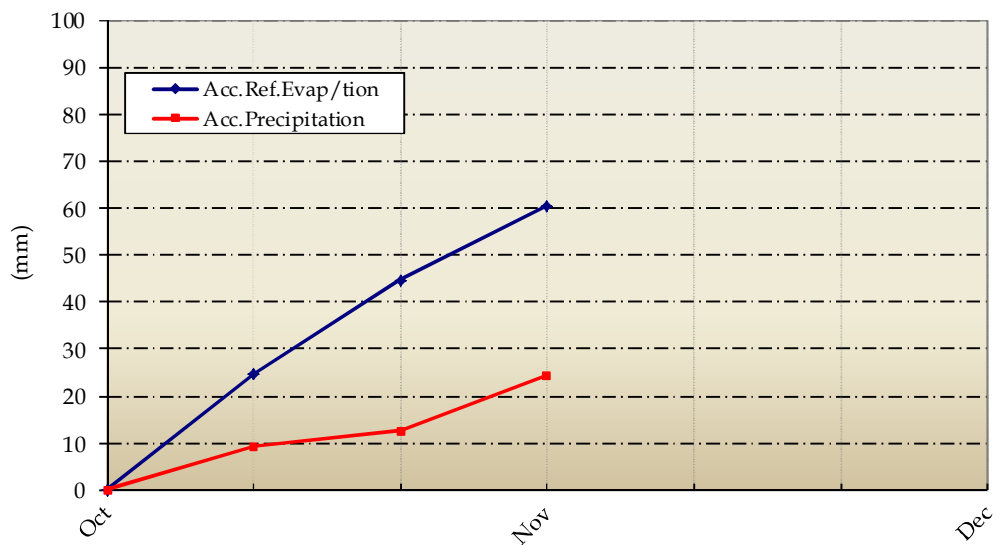
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



3rd 10-day period (21-31/10/2016)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	20.3	18.6	22.8	22.6	20.2	21.2	18.4	15.4	16.1	18.4	14.2	18.9	17.8	19.8
	Min	10.4	12.6	14.2	15.0	14.6	13.9	13.6	13.1	13.4	8.8	14.1	13.1	12.7	10.1
Relative Humidity	Max	95	100	100	99	78	94	85	76	88	94	82	90	87	-
	Min	47	90	57	46	50	48	56	58	50	42	49	54	58	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sunshine Duration		2.2	0.0	6.4	8.2	7.7	5.3	0.0	0.0	0.6	1.5	0.0	2.9	3.0	
Precipitation		0.1	11.6					0.0	0.1				11.8	54.3	27.5
Evaporation		-	-	-	-	-	-	-	-	-	-	-	-	31.5	
Growing Degrees	5	10.4	10.6	13.5	13.8	12.4	12.6	11.0	9.3	9.8	8.6	9.2	121.0	112.8	
	10	5.4	5.6	8.5	8.8	7.4	7.6	6.0	4.3	4.8	3.6	4.2	66.0	57.8	

3rd 10-day period (21-31/10/2016)	Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	15.8	17.4
Precipitation - Reference Evapotranspiration	-4.0	36.9
Number of Rainy Days	3.0	4.0
Number of Dry Days	9.0	9.0

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

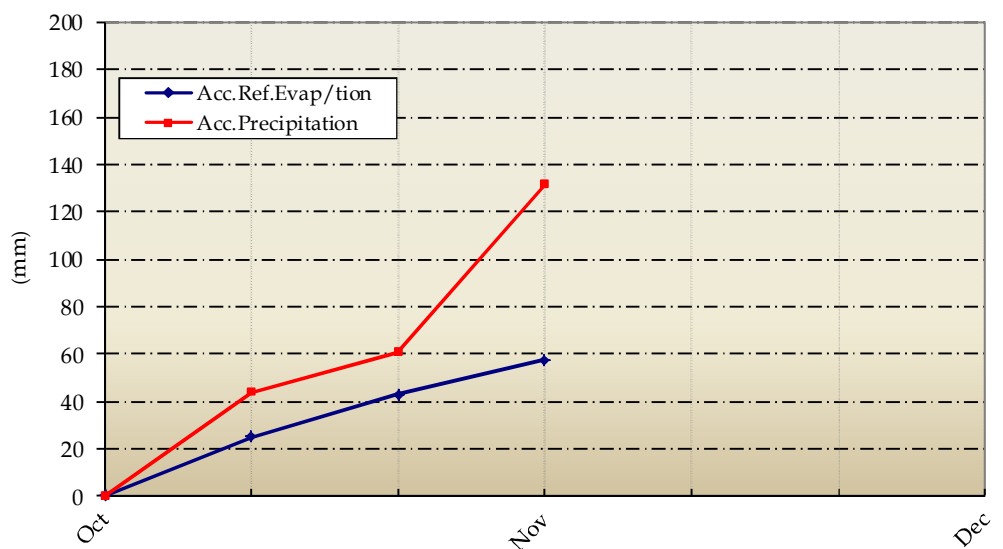


Tripoli

3rd 10-day period (21-31/10/2016)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	14.7	18.6	22.2	20.8	21.2	23.9	15.0	12.2	13.2	15.6	14.0	17.4	16.9	17.6
	Min	12.8	13.0	9.3	12.4	10.0	4.5	11.4	9.1	8.4	7.9	9.4	9.8	7.2	6.5
Relative Humidity	Max	100	100	100	100	100	100	100	100	100	100	100	100	96	-
	Min	85	78	56	58	44	31	91	96	76	80	55	68	54	-
Soil Temperature at 10 cm	06 UTC	16.2	-	-	16.0	14.2	12.6	14.8	13.6	12.2	12.8	14.2	14.1	13.7	12.8
	12 UTC	16.2	-	-	18.4	17.2	16.8	15.6	-	-	-	14.2	16.4	16.1	14.2
Sunshine Duration		0.0	6.8	0.0	6.6	9.7	9.2	0.0	0.0	2.3	1.8	2.4	3.5	4.3	5.3
Precipitation		9.8	24.5	0.0				13.8	20.9	1.3	0.4		70.7	36.7	39.1
Evaporation		-	-	-	1.9	2.3	2.5	0.5	0.1	0.6	0.7	2.2	-	15.6	23.9
Growing Degrees	5	8.8	10.8	10.8	11.6	10.6	9.2	8.2	5.7	5.8	6.8	6.7	94.8	78.1	77.8
	10	3.8	5.8	5.8	6.6	5.6	4.2	3.2	0.7	0.8	1.8	1.7	39.8	25.5	27.7

3rd 10-day period (21-31/10/2016)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	14.4	17.3	18.0
Precipitation - Reference Evapotranspiration	56.3	19.4	21.1
Number of Rainy Days	6.0	3.0	3.8
Number of Dry Days	8.0	3.0	-

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