



AGROMETEOROLOGICAL BULLETIN

*August 2011
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

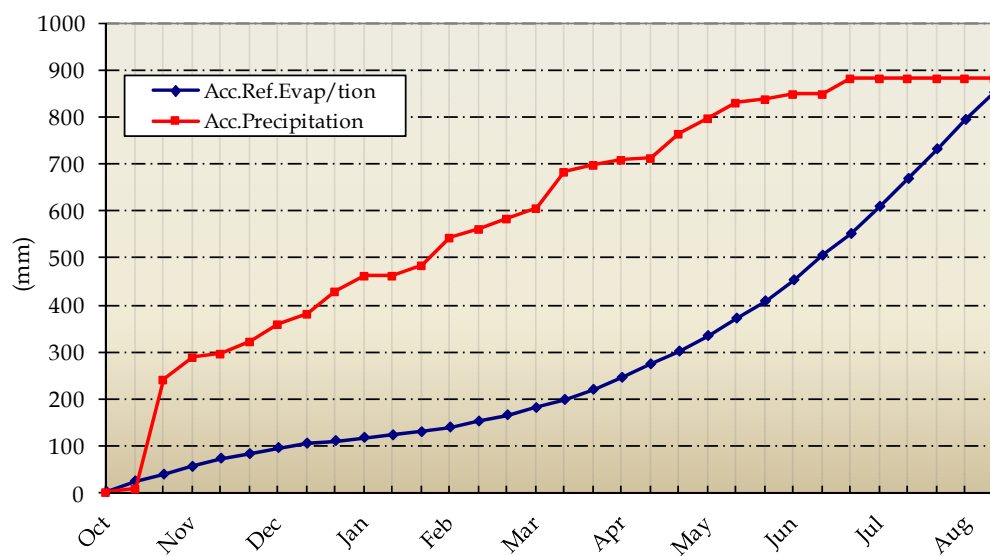
*Web addresses of HNMS
www.hnms.gr
www.emy.gov.gr
www.meteo.gov.gr
www.meteohellas.gr*

Agrinio

1st 10-day period (1-10/08/2011)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	32.4	33.6	34.4	35.0	35.6	34.0	34.6	36.4	36.6	36.0	34.9	-	34.0
	Min	17.2	17.0	18.0	18.4	18.6	18.4	19.5	19.2	19.2	18.6	18.4	-	17.6
Relative Humidity	Max	94	92	85	65	85	91	91	84	84	83	85	-	-
	Min	34	32	30	27	32	36	33	37	34	37	33	-	-
Soil Temperature at 10 cm	06 UTC	30.6	30.4	30.8	31.2	31.2	31.2	31.6	31.6	31.6	31.6	31.2	-	27.9
	12 UTC	35.8	35.4	35.6	36.0	36.2	36.2	36.6	36.8	37.0	36.0	36.2	-	34.1
Sunshine Duration		13.0	13.1	12.8	12.5	11.3	12.6	12.7	12.7	13.0	12.8	12.6	-	11.2
Precipitation													-	3.2
Evaporation		5.6	7.4	10.9	13.0	10.2	9.2	8.4	11.0	9.8	9.4	94.9	-	80.8
Growing Degrees	5	19.8	20.3	21.2	21.7	22.1	21.2	22.1	22.8	22.9	22.3	216.4	-	208.2
	10	14.8	15.3	16.2	16.7	17.1	16.2	17.1	17.8	17.9	17.3	166.4	-	158.2

1st 10-day period (1-10/08/2011)	Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	58.1	- 53.6
Precipitation - Reference Evapotranspiration	-58.1	- -50.4
Number of Rainy Days	0.0	- 0.5
Number of Dry Days	54.0	- -

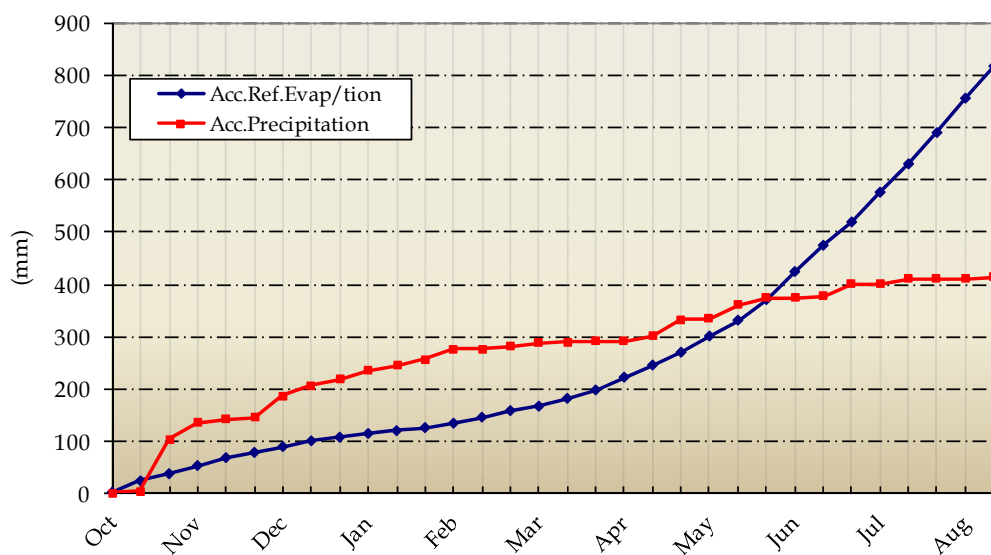
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



1st 10-day period (1-10/08/2011)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	34.0	32.2	31.6	33.2	33.0	30.8	32.8	33.2	32.6	34.0	32.7	34.0	31.3
	Min	20.0	23.0	20.6	20.0	21.6	21.6	20.0	20.6	20.6	21.0	20.9	23.3	17.9
Relative Humidity	Max	73	84	89	73	79	74	73	71	77	74	77	78	-
	Min	27	40	34	27	37	34	21	30	30	30	31	43	-
Soil Temperature at 10 cm	06 UTC	28.8	28.8	28.4	26.0	26.4	29.0	26.4	26.4	26.4	26.6	27.3	28.7	24.7
	12 UTC	32.4	31.0	29.4	30.8	28.4	30.0	29.0	30.0	30.0	30.6	30.2	31.0	29.0
Sunshine Duration		12.5	6.3	11.2	12.4	9.5	11.9	12.6	12.7	12.7	12.7	11.4	11.8	10.7
Precipitation			2.5									2.5		4.0
Evaporation		11.4	2.4	9.0	9.8	8.2	10.0	10.3	10.4	8.3	2.7	82.5	95.9	96.8
Growing Degrees	5	22.0	22.6	21.1	21.6	22.3	21.2	21.4	21.9	21.6	22.5	218.2	236.7	195.9
	10	17.0	17.6	16.1	16.6	17.3	16.2	16.4	16.9	16.6	17.5	168.2	186.7	145.9

1st 10-day period (1-10/08/2011)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	61.5	58.7	58.5
Precipitation - Reference Evapotranspiration	-59.0	-58.7	-54.5
Number of Rainy Days	1.0	0.0	0.7
Number of Dry Days	28.0	13.0	-

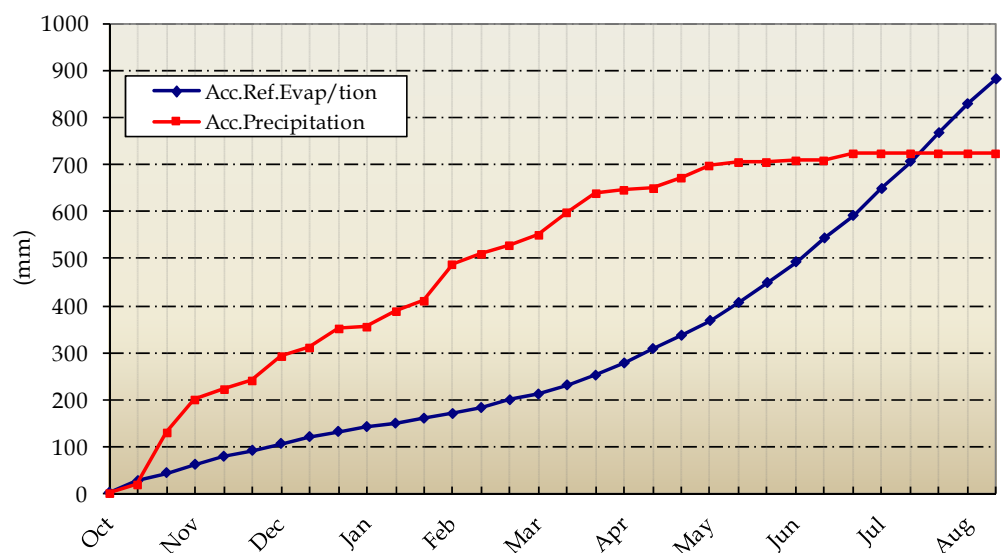
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



1st 10-day period (1-10/08/2011)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	29.2	29.6	31.4	31.4	31.0	32.6	31.4	31.8	31.2	32.4	31.2	31.0	31.3
	Min	17.4	18.4	19.0	19.0	20.2	20.0	20.0	20.8	20.6	20.4	19.6	20.1	18.8
Relative Humidity	Max	91	91	88	89	95	94	91	91	93	96	92	93	-
	Min	42	44	43	41	39	32	52	46	43	47	43	48	-
Soil Temperature at 10 cm	06 UTC	27.0	27.2	27.6	28.0	28.6	28.8	28.4	28.6	28.6	28.6	28.1	28.8	27.8
	12 UTC	32.6	33.5	33.6	34.4	34.6	34.8	35.0	34.4	34.8	35.0	34.3	36.7	32.1
Sunshine Duration		12.3	12.0	12.0	11.8	11.1	10.9	11.6	11.6	11.6	11.0	11.6	11.8	11.6
Precipitation														0.2
Evaporation		8.0	7.1	7.1	9.1	8.4	9.4	8.1	8.0	8.2	9.2	82.6	76.5	74.9
Growing Degrees	5	18.3	19.0	20.2	20.2	20.6	21.3	20.7	21.3	20.9	21.4	203.9	205.5	200.3
	10	13.3	14.0	15.2	15.2	15.6	16.3	15.7	16.3	15.9	16.4	153.9	155.5	150.3

1st 10-day period (1-10/08/2011)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	53.0	53.1	52.3
Precipitation - Reference Evapotranspiration	-53.0	-53.1	-52.1
Number of Rainy Days	0.0	0.0	0.1
Number of Dry Days	56.0	48.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

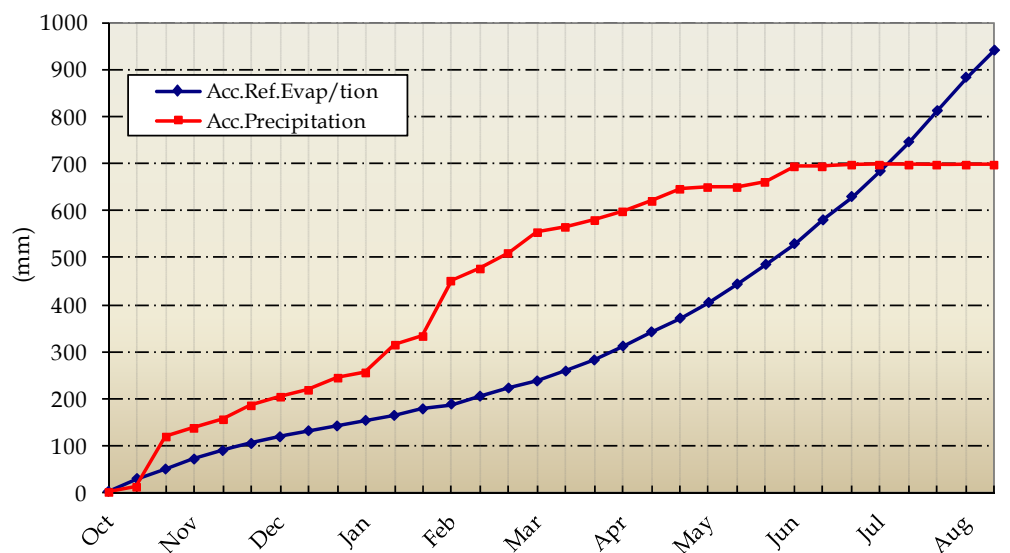


Kalamata

1st 10-day period (1-10/08/2011)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	33.6	30.6	30.2	32.2	30.4	30.2	30.4	31.0	32.4	33.0	31.4	32.2	31.8
	Min	18.4	18.6	18.8	19.2	18.8	18.8	18.4	20.4	20.0	21.2	19.3	20.4	18.3
Relative Humidity	Max	91	90	91	89	88	92	94	94	92	91	91	88	-
	Min	23	39	48	34	40	43	45	47	39	40	40	40	-
Soil Temperature at 10 cm	06 UTC	26.0	26.0	25.6	26.0	26.0	26.2	26.2	26.4	26.6	27.2	26.2	26.3	26.3
	12 UTC	29.0	29.0	29.0	28.6	28.8	28.6	29.0	29.2	29.2	29.6	29.0	28.7	30.4
Sunshine Duration		12.6	12.4	8.8	12.0	12.0	11.5	10.7	12.1	12.2	12.3	11.7	12.1	11.0
Precipitation				0.0								0.0		3.9
Evaporation		11.6	7.2	5.2	8.8	9.4	10.6	9.6	7.8	7.8	7.0	85.0	86.6	84.1
Growing Degrees	5	21.0	19.6	19.5	20.7	19.6	19.5	19.4	20.7	21.2	22.1	203.3	212.7	200.7
	10	16.0	14.6	14.5	15.7	14.6	14.5	14.4	15.7	16.2	17.1	153.3	162.7	150.7

1st 10-day period (1-10/08/2011)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	57.9	60.6	56.0
Precipitation - Reference Evapotranspiration	-57.9	-60.6	-52.1
Number of Rainy Days	0.0	0.0	0.5
Number of Dry Days	56.0	48.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

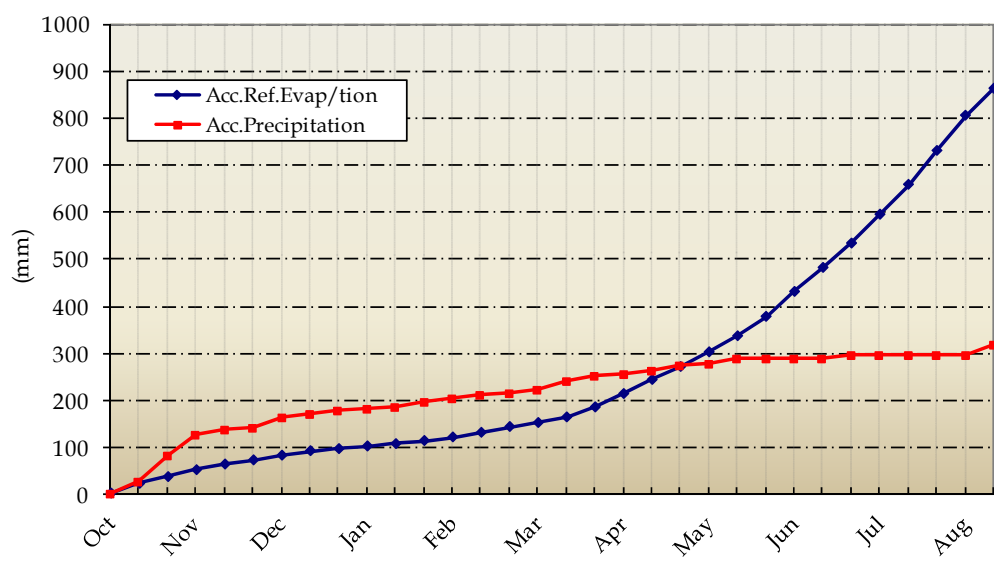


Larisa

1st 10-day period (1-10/08/2011)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	33.0	31.6	32.4	34.6	33.0	30.4	33.2	35.0	36.8	34.2	33.4	35.2	33.2
	Min	20.2	18.0	18.6	18.2	18.8	18.0	20.6	19.6	19.6	22.0	19.4	21.0	18.0
Relative Humidity	Max	91	96	94	92	93	94	89	91	88	89	92	78	-
	Min	34	44	39	33	40	53	40	36	35	39	39	30	-
Soil Temperature at 10 cm	06 UTC	29.0	27.0	26.8	26.6	27.0	26.6	26.6	28.2	27.8	28.0	27.4	26.9	27.1
	12 UTC	31.6	30.0	29.0	29.2	29.0	28.6	29.2	29.6	30.2	30.0	29.6	30.1	29.4
Sunshine Duration		10.5	10.5	12.0	11.8	9.0	12.2	12.2	12.1	12.2	11.1	11.4	11.7	10.5
Precipitation			6.2	4.2		0.0	3.4				9.0	22.8	13.5	4.2
Evaporation		11.2	4.2	9.7	2.8	17.3	7.5	6.2	12.4	7.8	12.7	91.8	93.3	91.8
Growing Degrees	5	21.6	19.8	20.5	21.4	20.9	19.2	21.9	22.3	23.2	23.1	213.9	231.2	206.1
	10	16.6	14.8	15.5	16.4	15.9	14.2	16.9	17.3	18.2	18.1	163.9	181.2	156.1

1st 10-day period (1-10/08/2011)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	57.6	59.5	58.6
Precipitation - Reference Evapotranspiration	-34.8	-46.0	-54.4
Number of Rainy Days	4.0	3.0	1.1
Number of Dry Days	46.0	8.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

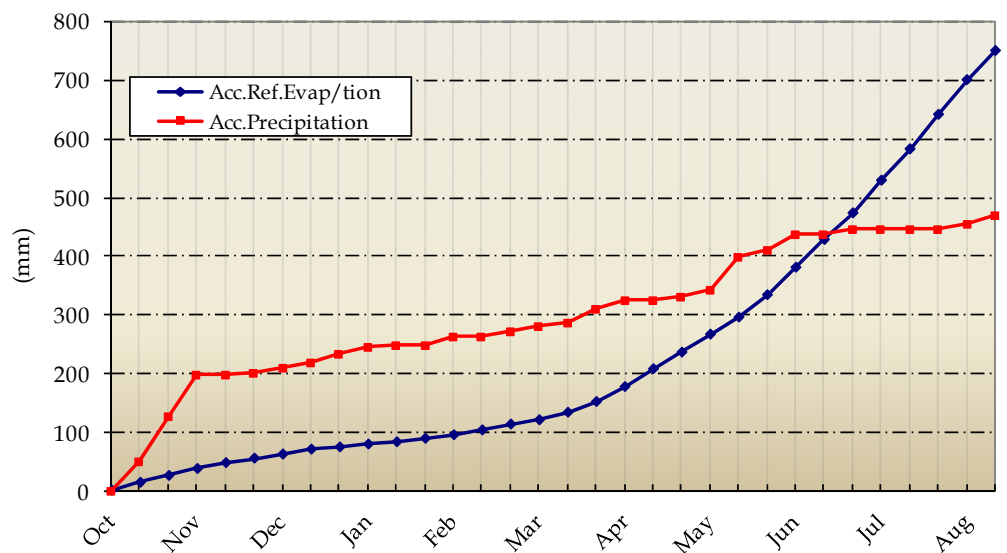


1st 10-day period (1-10/08/2011)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	34.0	33.6	34.6	35.4	33.6	33.4	35.2	36.2	38.2	35.4	35.0	35.6	32.7
	Min	18.6	18.4	19.2	20.4	21.4	18.8	20.8	20.6	21.0	17.6	19.7	21.2	18.7
Relative Humidity	Max	92	93	85	77	90	91	72	79	82	95	86	72	-
	Min	26	25	22	22	33	31	29	29	24	30	27	33	-
Soil Temperature at 10 cm	06 UTC	29.6	28.0	28.4	29.2	29.8	28.8	29.6	30.0	30.4	30.8	29.5	26.9	26.0
	12 UTC	31.0	29.4	31.0	31.8	32.0	31.0	31.8	32.2	32.4	32.6	31.5	29.1	29.5
Sunshine Duration		7.0	11.6	10.6	12.1	6.9	10.4	12.2	12.3	12.3	8.4	10.4	10.3	10.1
Precipitation		3.5	1.0			0.1	0.2				10.6	15.4		7.4
Evaporation		7.5	9.0	7.5	7.5	6.1	6.5	6.4	6.4	6.9	4.9	68.7	67.0	70.0
Growing Degrees	5	21.3	21.0	21.9	22.9	22.5	21.1	23.0	23.4	24.6	21.5	223.2	234.2	198.0
	10	16.3	16.0	16.9	17.9	17.5	16.1	18.0	18.4	19.6	16.5	173.2	184.2	150.1

Series

1st 10-day period (1-10/08/2011)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	49.8	51.3	46.4
Precipitation - Reference Evapotranspiration	-34.4	-51.3	-39.0
Number of Rainy Days	5.0	0.0	1.7
Number of Dry Days	6.0	15.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

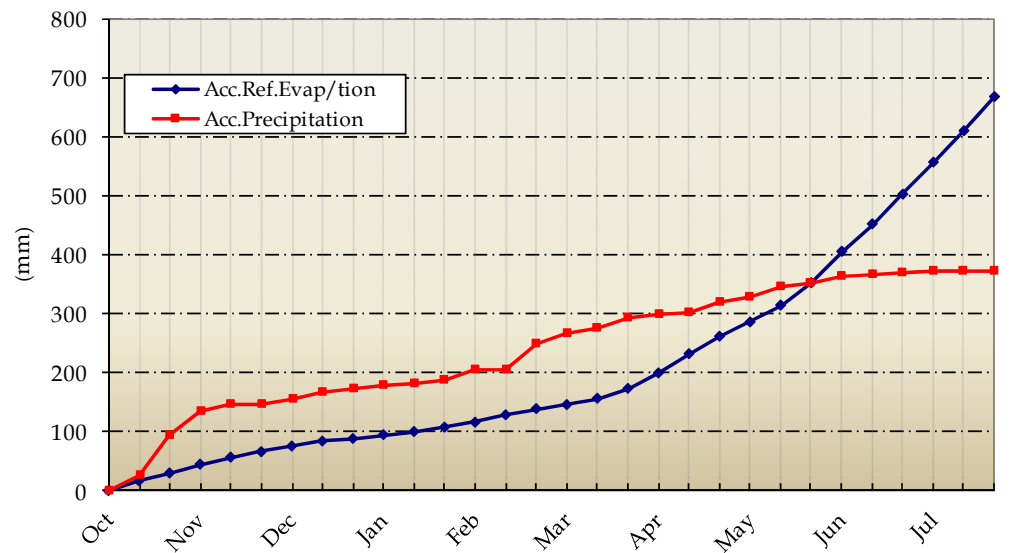


1st 10-day period (1-10/08/2011)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	32.2	30.8	-	-	-	-	-	-	-	-	-	34.3	31.9
	Min	16.4	19.4	-	-	-	-	-	-	-	-	-	21.0	18.4
Relative Humidity	Max	93	-	-	-	-	-	-	-	-	-	-	91	-
	Min	43	-	-	-	-	-	-	-	-	-	-	42	-
Soil Temperature at 10 cm	06 UTC	25.8	25.2	-	-	-	-	-	-	-	-	-	27.2	25.9
	12 UTC	26.8	26.8	-	-	-	-	-	-	-	-	-	30.4	27.5
Sunshine Duration		-	-	-	-	-	-	-	-	-	-	-	11.2	10.0
Precipitation		-	-	-	-	-	-	-	-	-	-	-	1.8	5.7
Evaporation		5.8	-	-	-	-	-	-	-	-	-	-	47.5	58.3
Growing Degrees	5	19.3	20.1	-	-	-	-	-	-	-	-	-	226.8	201.3
	10	14.3	15.1	-	-	-	-	-	-	-	-	-	176.8	151.3

1st 10-day period (1-10/08/2011)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	-	52.2	47.3
Precipitation - Reference Evapotranspiration	-	-50.4	-41.6
Number of Rainy Days	-	1.0	1.0
Number of Dry Days	-	8.0	-

The station is temporarily closed

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

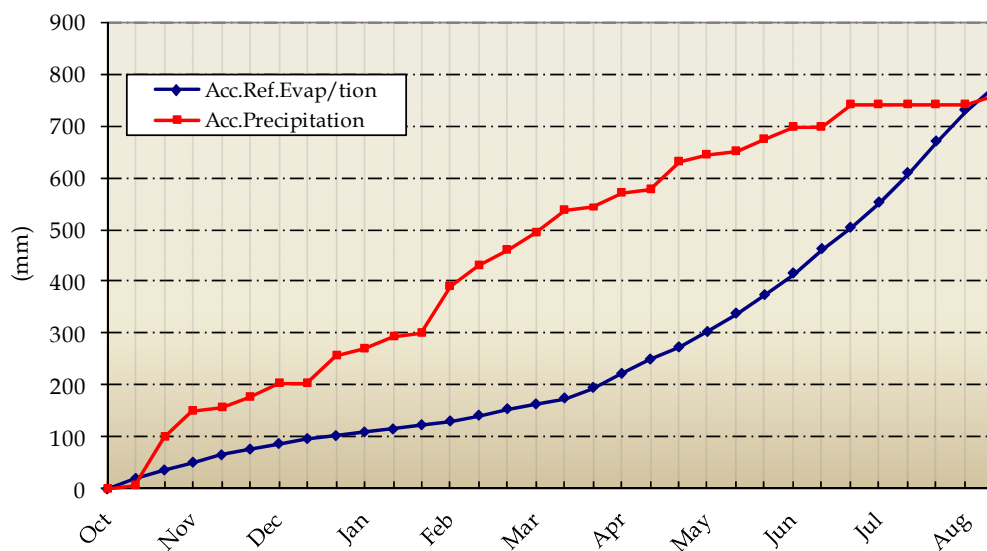


Tripoli

1st 10-day period (1-10/08/2011)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	32.2	29.6	27.8	31.2	31.4	29.6	31.4	32.6	35.4	34.6	31.6	-	30.8
	Min	11.8	13.2	14.6	13.6	15.2	15.0	15.6	15.2	15.6	16.4	14.6	-	14.8
Relative Humidity	Max	86	89	95	91	84	98	98	94	94	84	91	-	-
	Min	20	33	41	31	33	43	36	32	27	30	33	-	-
Soil Temperature at 10 cm	06 UTC	26.0	27.0	24.4	23.6	25.4	22.2	22.2	23.0	24.4	26.0	24.4	-	25.8
	12 UTC	33.8	33.6	30.2	31.4	31.4	30.0	29.6	30.8	32.0	33.4	31.6	-	28.5
Sunshine Duration		12.9	8.3	7.6	10.9	8.3	7.1	6.5	10.3	12.1	12.6	9.7	-	10.5
Precipitation			5.6			5.3	7.0					17.9	-	6.7
Evaporation		7.2	7.4	3.9	7.2	4.4	4.7	3.4	7.4	6.8	11.3	63.7	-	66.4
Growing Degrees	5	17.0	16.4	16.2	17.4	18.3	17.3	18.5	18.9	20.5	20.5	181.0	-	178.4
	10	12.0	11.4	11.2	12.4	13.3	12.3	13.5	13.9	15.5	15.5	131.0	-	128.4

1st 10-day period (1-10/08/2011)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	45.3	-	53.5
Precipitation - Reference Evapotranspiration	-27.4	-	-46.8
Number of Rainy Days	3.0	-	1.1
Number of Dry Days	46.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

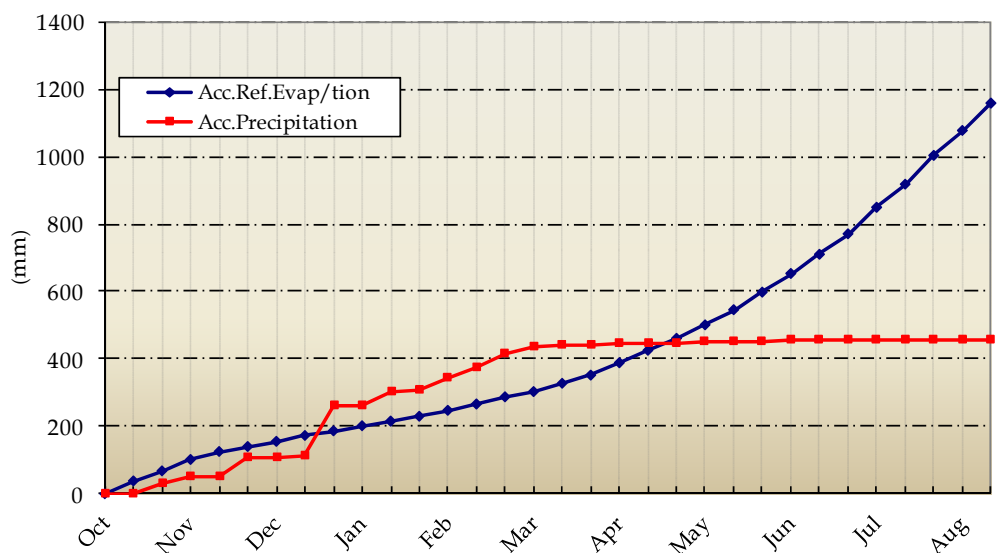


Tympaki

1st 10-day period (1-10/08/2011)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	31.8	31.8	33.0	34.0	34.4	35.0	33.8	33.2	35.8	36.6	33.9	32.0	32.6
	Min	21.0	21.4	19.6	23.2	19.0	19.6	21.4	21.6	20.6	22.2	21.0	22.7	20.7
Relative Humidity	Max	92	76	73	59	46	52	45	45	39	72	60	87	-
	Min	25	35	28	18	17	22	32	25	17	18	24	42	-
Soil Temperature at 10 cm	06 UTC	31.6	32.0	31.6	31.6	30.6	30.8	31.0	30.4	30.2	30.0	31.0	31.4	31.1
	12 UTC	37.0	37.2	36.4	35.8	36.4	35.8	35.4	35.0	35.2	36.0	36.0	36.8	35.3
Sunshine Duration		12.7	12.7	13.0	12.7	12.6	12.5	12.7	12.9	13.0	12.8	12.8	11.0	12.0
Precipitation														
Evaporation		8.8	9.6	13.5	14.5	13.5	14.2	15.5	13.6	12.0	13.5	128.7	92.2	121.2
Growing Degrees	5	21.4	21.6	21.3	23.6	21.7	22.3	22.6	22.4	23.2	24.4	224.5	223.6	215.8
	10	16.4	16.6	16.3	18.6	16.7	17.3	17.6	17.4	18.2	19.4	174.5	173.6	166.0

1st 10-day period (1-10/08/2011)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	81.2	61.1	64.7
Precipitation - Reference Evapotranspiration	-81.2	-61.1	-64.7
Number of Rainy Days	0.0	0.0	0.0
Number of Dry Days	74.0	66.0	-

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.

Mesurements 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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ΕΘΝΙΚΗ
ΜΕΤΕΩΡΟΛΟΓΙΚΗ
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