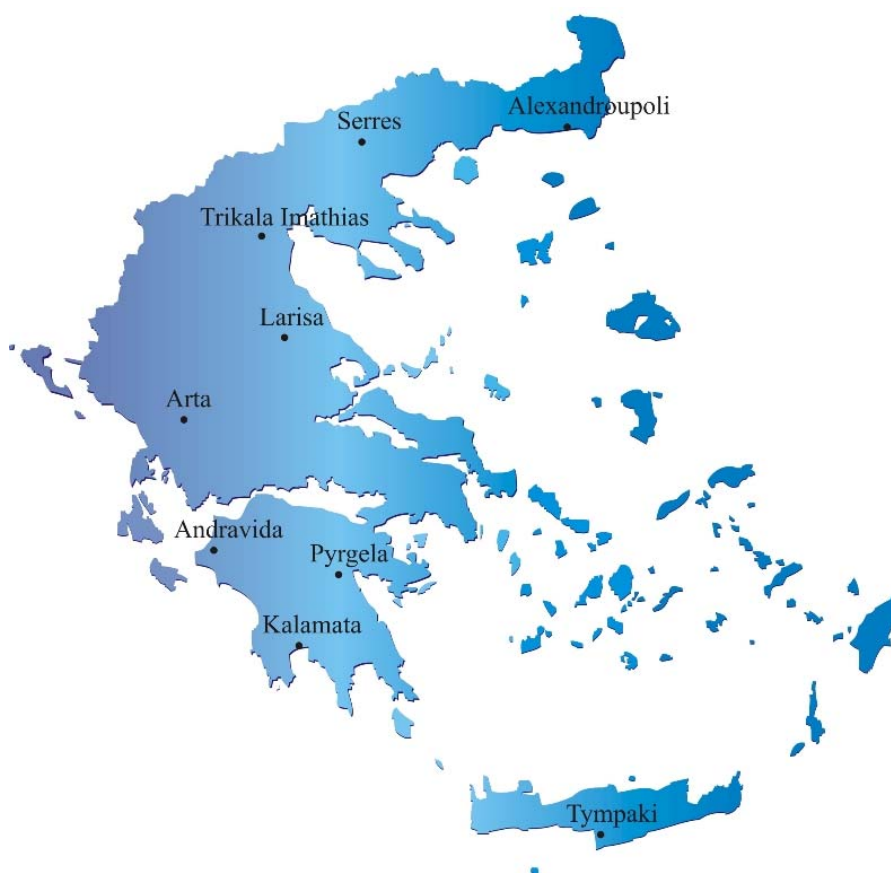




# AGROMETEOROLOGICAL BULLETIN

*June 2009*  
*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



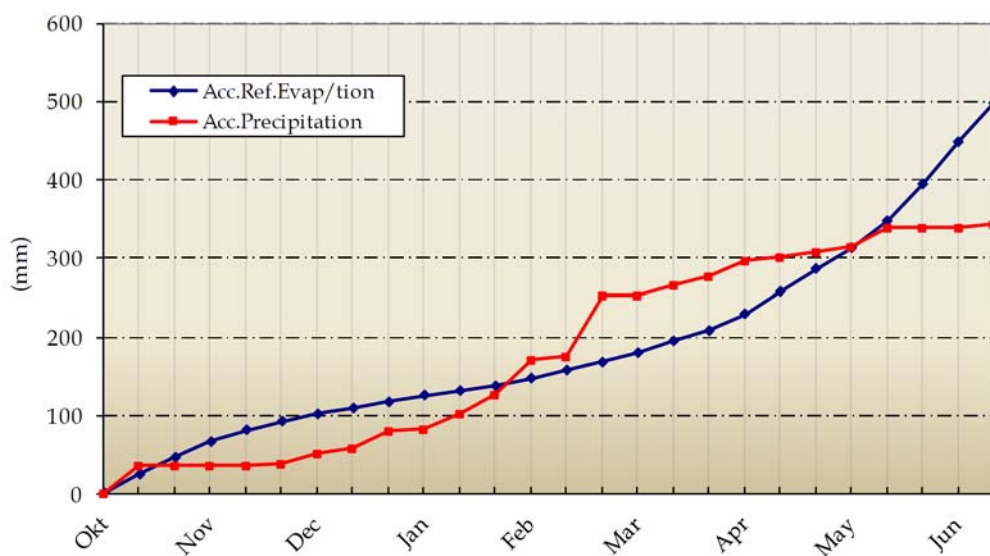
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*Web addresses of HNMS*  
[www.hnms.gr](http://www.hnms.gr)  
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[www.meteo.gov.gr](http://www.meteo.gov.gr)  
[www.meteohellas.gr](http://www.meteohellas.gr)

1st 10-day period (1-10/06/2009)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	27.6	26.4	26.0	22.4	24.6	25.4	28.6	32.4	33.6	33.2	28.0	-	25.8
	Min	13.2	15.4	17.6	16.4	15.0	13.4	15.0	15.0	21.6	18.8	16.1	-	14.0
Relative Humidity	Max	84	87	94	98	84	86	85	89	74	71	85	-	-
	Min	41	35	58	63	56	51	55	31	23	26	44	-	-
Soil Temperature at 10 cm	06 UTC	22.0	23.0	22.6	23.2	20.0	21.6	22.4	23.8	25.6	25.6	23.0	-	20.6
	12 UTC	25.8	25.4	26.6	23.6	25.0	26.0	26.0	26.8	29.2	29.8	26.4	-	25.3
Sunshine Duration		10.2	7.7	11.9	3.4	11.4	12.6	11.9	10.5	13.2	11.4	10.4	-	9.7
Precipitation			0.0		4.4							4.4	-	10.6
Evaporation		6.4	3.8	7.0	10.2	6.3	5.9	8.5	11.0	10.9	9.6	79.6	-	72.8
Growing Degrees	5	15.4	15.9	16.8	14.4	14.8	14.4	16.8	18.7	22.6	21.0	170.8	-	148.7
	10	10.4	10.9	11.8	9.4	9.8	9.4	11.8	13.7	17.6	16.0	120.8	-	98.7

1st 10-day period (1-10/06/2009)	Previous Year Value	Past Years Mean Value	
Reference Evapotranspiration	49.8	-	48.0
Precipitation - Reference Evapotranspiration	-45.4	-	-37.4
Number of Rainy Days	1.0	-	2.2
Number of Dry Days	4.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

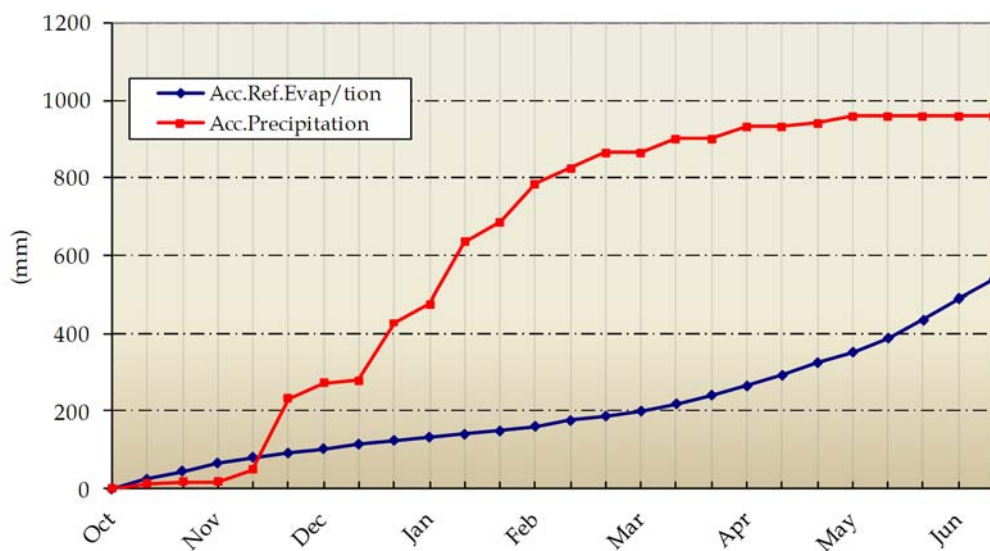


Andravida

1st 10-day period (1-10/06/2009)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	27.0	28.2	25.0	24.0	22.4	27.8	30.8	31.6	29.4	31.4	27.8	-	26.9
	Min	15.6	18.0	16.2	16.2	15.0	14.8	15.6	16.0	15.4	19.2	16.2	-	15.3
Relative Humidity	Max	93	96	94	96	96	96	94	89	91	88	93	-	-
	Min	46	39	54	56	41	38	32	29	40	36	41	-	-
Soil Temperature at 10 cm	06 UTC	24.0	24.0	24.2	22.4	22.2	23.6	24.2	24.6	24.8	26.0	24.0	-	23.0
	12 UTC	29.6	30.4	30.6	28.4	30.2	30.8	31.0	31.2	32.0	33.2	30.7	-	27.7
Sunshine Duration		6.1	10.3	4.3	13.0	13.1	13.3	9.5	13.1	13.5	13.2	10.9	-	11.1
Precipitation													-	2.3
Evaporation		4.0	9.6	12.6	5.9	6.9	7.2	6.8	12.6	9.0	12.8	87.4	-	67.5
Growing Degrees	5	16.3	18.1	15.6	15.1	13.7	16.3	18.2	18.8	17.4	20.3	169.8	-	160.7
	10	11.3	13.1	10.6	10.1	8.7	11.3	13.2	13.8	12.4	15.3	119.8	-	110.7

1st 10-day period (1-10/06/2009)	Previous Year Value	Past Years Mean Value	
Reference Evapotranspiration	49.3	-	48.5
Precipitation - Reference Evapotranspiration	-49.3	-	-46.2
Number of Rainy Days	0.0	-	0.7
Number of Dry Days	43.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

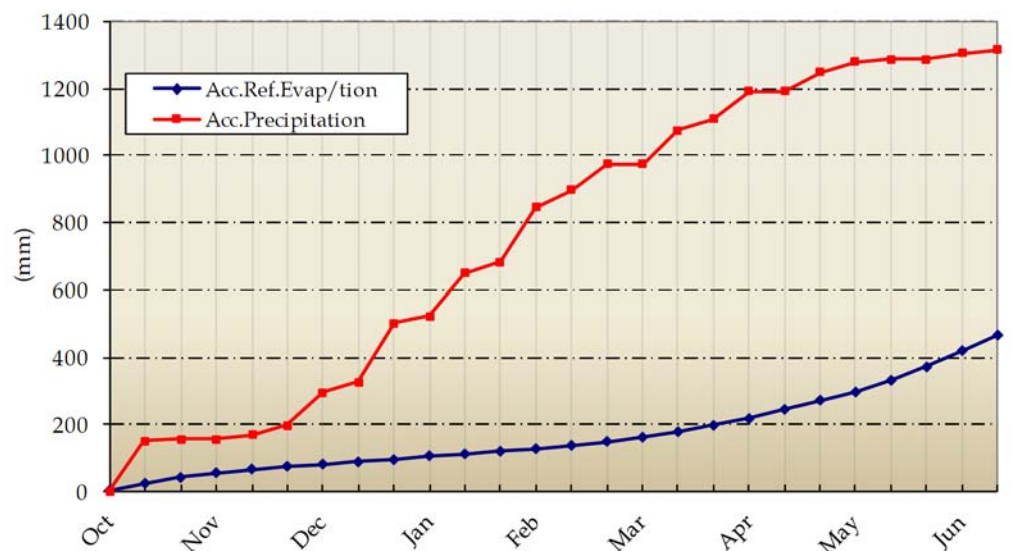


Arta

1st 10-day period (1-10/06/2009)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	28.0	27.2	25.0	25.2	27.8	28.4	-	32.0	31.4	34.2	28.8	-	27.8
	Min	15.4	16.0	15.6	13.0	15.4	12.4	12.4	13.4	14.8	17.6	14.6	-	14.7
Relative Humidity	Max	88	89	92	-	90	78	77	72	78	87	83	-	-
	Min	47	55	51	-	42	36	47	34	45	36	44	-	-
Soil Temperature at 10 cm	06 UTC	23.2	23.0	23.2	22.0	-	22.4	23.0	23.2	24.0	25.0	23.2	-	22.6
	12 UTC	25.2	25.0	23.8	24.4	24.6	25.2	-	26.0	26.4	28.0	25.4	-	28.3
Sunshine Duration		6.4	10.0	5.8	12.4	12.8	12.8	12.9	11.2	13.0	12.6	11.0	-	10.1
Precipitation				12.3								12.3	-	7.4
Evaporation		4.7	5.8	4.5	6.4	5.6	6.1	6.6	6.1	6.0	7.8	59.6	-	-
Growing Degrees	5	16.7	16.6	15.3	14.1	16.6	15.4	-	17.7	18.1	20.9	-	-	162.3
	10	11.7	11.6	10.3	9.1	11.6	10.4	-	12.7	13.1	15.9	-	-	112.3

1st 10-day period (1-10/06/2009)	Previous Year Value	Past Years Mean Value	
Reference Evapotranspiration	46.5	-	45.3
Precipitation - Reference Evapotranspiration	-34.2	-	-37.9
Number of Rainy Days	1.0	-	1.4
Number of Dry Days	3.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



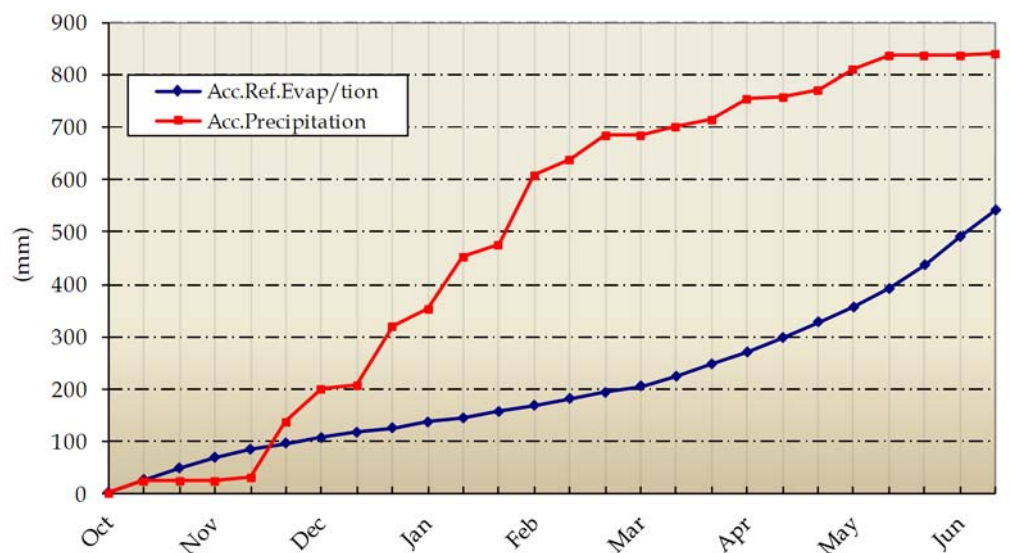


Kalamata

1st 10-day period (1-10/06/2009)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	29.0	27.6	27.0	25.8	27.8	28.0	29.8	32.8	31.0	31.4	29.0	-	27.6
	Min	16.0	17.8	17.0	14.0	15.6	14.4	15.6	15.2	18.4	17.0	16.1	-	14.5
Relative Humidity	Max	89	90	93	95	91	89	83	71	86	86	87	-	-
	Min	39	48	50	41	39	30	40	21	38	34	38	-	-
Soil Temperature at 10 cm	06 UTC	21.6	21.8	21.6	21.2	21.2	21.0	21.4	21.4	22.0	22.4	21.6	-	21.6
	12 UTC	23.4	23.4	22.5	22.4	22.8	21.8	23.6	26.0	26.0	24.4	23.6	-	25.8
Sunshine Duration		8.8	10.5	7.8	7.0	13.3	13.0	12.1	12.1	13.0	12.8	11.0	-	10.5
Precipitation			0.1	1.7	0.2							2.0	-	2.7
Evaporation		7.1	7.0	5.0	4.0	7.0	7.0	3.0	13.0	5.0	9.0	67.1	-	75.1
Growing Degrees	5	17.5	17.7	17.0	14.9	16.7	16.2	17.7	19.0	19.7	19.2	175.6	-	160.6
	10	12.5	12.7	12.0	9.9	11.7	11.2	12.7	14.0	14.7	14.2	125.6	-	110.6

1st 10-day period (1-10/06/2009)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	51.0	-	50.2
Precipitation - Reference Evapotranspiration	-49.0	-	-47.5
Number of Rainy Days	3.0	-	0.9
Number of Dry Days	14.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

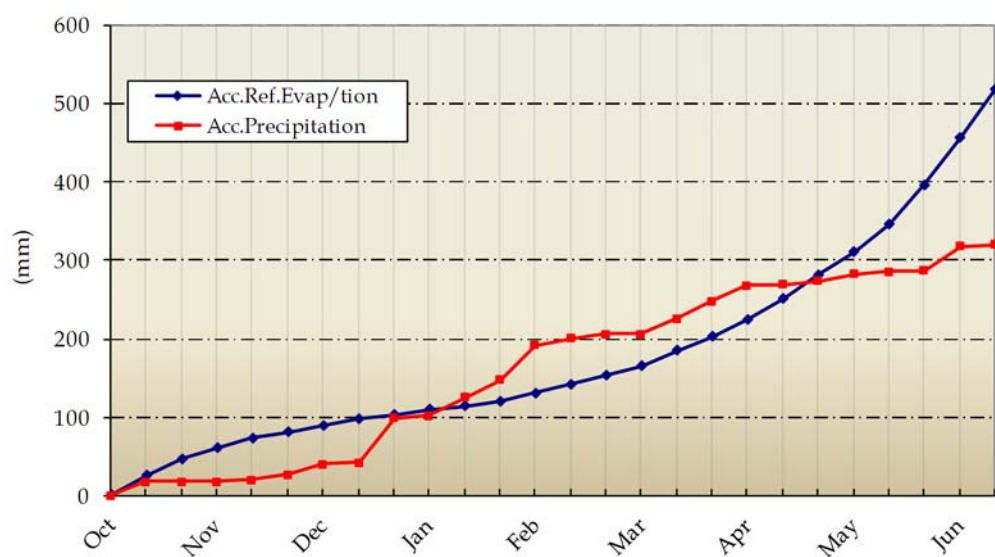


Larisa

1st 10-day period (1-10/06/2009)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	27.8	31.0	27.8	29.2	32.0	34.4	36.2	35.2	35.4	36.2	32.5	-	29.7
	Min	16.0	17.2	16.0	15.6	13.0	14.0	15.0	19.4	17.6	15.8	16.0	-	14.1
Relative Humidity	Max	88	88	77	93	84	87	87	90	74	75	84	-	-
	Min	44	26	35	25	23	19	22	19	14	20	25	-	-
Soil Temperature at 10 cm	06 UTC	22.2	22.0	22.6	22.2	22.2	22.8	24.0	25.0	24.8	24.8	23.3	-	21.7
	12 UTC	25.4	25.2	-	25.4	25.6	26.6	26.8	27.8	27.8	28.2	26.5	-	24.3
Sunshine Duration		7.8	10.6	5.9	11.1	12.2	12.8	12.3	11.1	12.4	11.5	10.8	-	10.4
Precipitation					1.2							1.2	-	9.2
Evaporation		6.1	8.6	6.1	9.3	10.1	7.3	6.6	14.5	12.3	9.0	89.9	-	79.0
Growing Degrees	5	16.9	19.1	16.9	17.4	17.5	19.2	20.6	22.3	21.5	21.0	192.4	-	169.0
	10	11.9	14.1	11.9	12.4	12.5	14.2	15.6	17.3	16.5	16.0	142.4	-	119.0

1st 10-day period (1-10/06/2009)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	61.8	-	54.0
Precipitation - Reference Evapotranspiration	-60.6	-	-44.8
Number of Rainy Days	1.0	-	2.3
Number of Dry Days	5.0	-	-

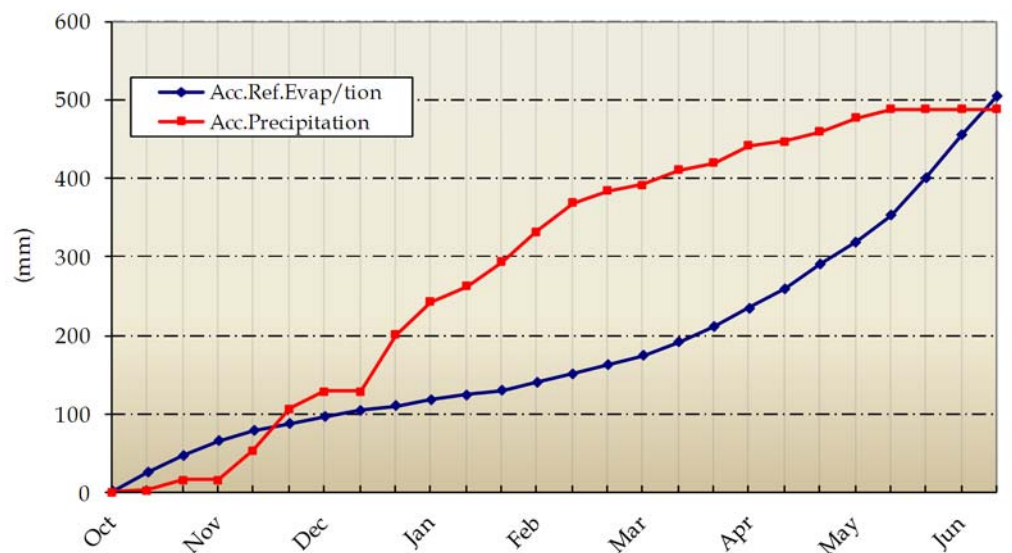
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



1st 10-day period (1-10/06/2009)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	28.0	29.4	30.0	30.2	30.0	32.2	32.0	35.0	38.4	38.4	32.4	-	29.8
	Min	12.8	15.2	13.0	13.4	12.6	12.4	13.4	13.2	13.0	16.0	13.5	-	12.9
Relative Humidity	Max	82	81	57	67	74	64	65	55	62	-	67	-	-
	Min	48	40	36	30	35	23	29	32	17	-	32	-	-
Soil Temperature at 10 cm	06 UTC	24.0	24.0	23.8	22.6	23.4	24.0	24.4	25.2	25.0	27.0	24.3	-	22.1
	12 UTC	31.6	31.4	29.8	31.4	31.8	33.0	34.0	34.0	35.0	35.0	32.7	-	30.5
Sunshine Duration		8.3	9.9	7.9	11.8	12.3	12.5	11.1	10.3	11.7	12.3	10.8	-	10.2
Precipitation													-	4.7
Evaporation		8.3	4.9	6.9	5.6	5.0	8.6	6.4	7.2	7.0	9.5	69.4	-	65.8
Growing Degrees	5	15.4	17.3	16.5	16.8	16.3	17.3	17.7	19.1	20.7	22.2	179.3	-	163.5
	10	10.4	12.3	11.5	11.8	11.3	12.3	12.7	14.1	15.7	17.2	129.3	-	113.5

1st 10-day period (1-10/06/2009)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	49.6	-	47.2
Precipitation - Reference Evapotranspiration	-49.6	-	-42.5
Number of Rainy Days	0.0	-	1.3
Number of Dry Days	35.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

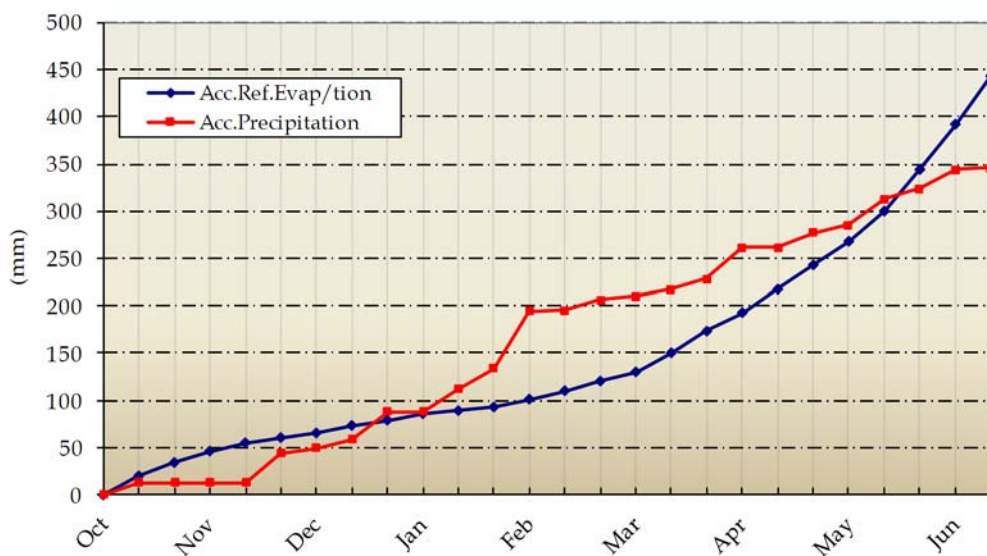


Series

1st 10-day period (1-10/06/2009)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	28.4	29.4	27.4	31.2	31.6	33.8	35.0	34.4	36.6	36.2	32.4	-	28.7
	Min	15.0	16.2	15.4	15.4	15.0	16.0	17.4	18.0	18.2	18.2	16.5	-	15.4
Relative Humidity	Max	81	74	84	76	73	71	67	66	66	53	71	-	-
	Min	41	46	55	23	29	29	27	27	27	26	33	-	-
Soil Temperature at 10 cm	06 UTC	21.0	21.6	21.6	22.2	22.2	22.2	24.0	24.6	25.2	25.2	23.0	-	21.3
	12 UTC	22.4	22.6	24.0	25.6	25.8	25.8	26.6	26.2	27.2	27.6	25.4	-	25.2
Sunshine Duration		6.4	8.5	6.7	12.0	13.0	12.4	12.9	9.8	9.8	10.8	10.2	-	9.3
Precipitation				0.0	1.0							1.0	-	18.7
Evaporation		3.2	3.1	0.2	3.0	3.7	4.2	4.6	3.0	3.0	0.6	28.6	-	61.1
Growing Degrees	5	16.7	17.8	16.4	18.3	18.3	19.9	21.2	21.2	22.4	22.2	194.4	-	170.3
	10	11.7	12.8	11.4	13.3	13.3	14.9	16.2	16.2	17.4	17.2	144.4	-	120.3

1st 10-day period (1-10/06/2009)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	51.2	-	45.4
Precipitation - Reference Evapotranspiration	-50.2	-	-26.7
Number of Rainy Days	1.0	-	3.0
Number of Dry Days	4.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



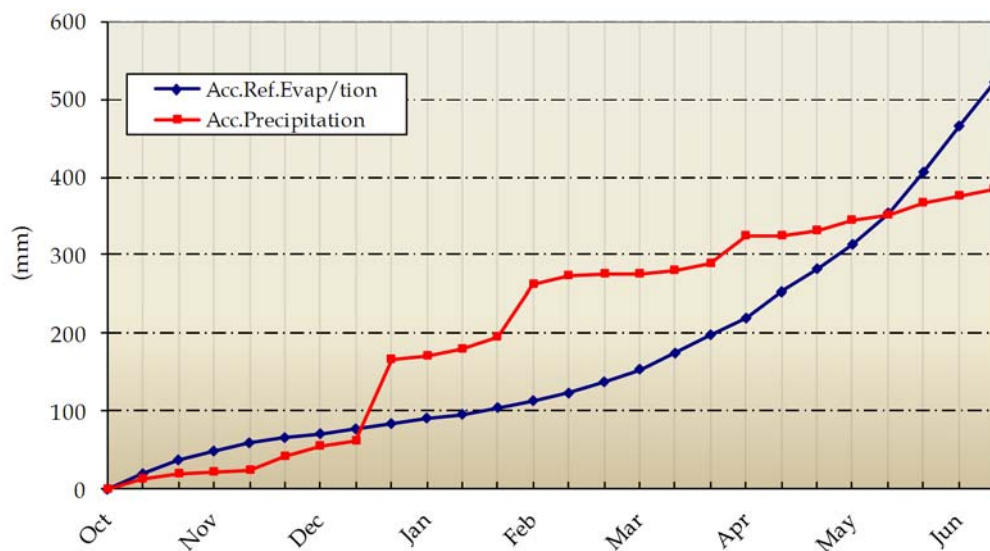


Trikala Imathias

1st 10-day period (1-10/06/2009)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	27.6	26.6	27.8	29.6	29.8	30.4	31.2	34.8	34.0	34.6	30.6	-	28.7
	Min	17.0	16.2	16.0	15.8	14.6	16.2	18.0	22.0	16.8	18.0	17.1	-	15.8
Relative Humidity	Max	92	94	95	90	91	90	92	95	95	84	92	-	-
	Min	32	52	28	20	31	30	47	46	25	34	34	-	-
Soil Temperature at 10 cm	06 UTC	21.4	21.6	22.2	21.6	21.6	22.6	23.6	24.6	25.0	25.8	23.0	-	21.9
	12 UTC	26.0	25.6	27.0	25.6	27.6	28.0	28.0	26.2	30.0	30.0	27.4	-	23.7
Sunshine Duration		4.2	10.3	4.6	11.7	11.7	11.1	11.7	9.8	11.2	10.6	9.7	-	9.8
Precipitation				2.2	6.0							8.2	-	9.9
Evaporation		1.2	4.0	3.4	5.5	5.6	4.8	5.6	5.8	7.0	6.0	48.9	-	60.8
Growing Degrees	5	17.3	16.4	16.9	17.7	17.2	18.3	19.6	23.4	20.4	21.3	188.5	-	171.3
	10	12.3	11.4	11.9	12.7	12.2	13.3	14.6	18.4	15.4	16.3	138.5	-	121.8

1st 10-day period (1-10/06/2009)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	56.3	-	48.7
Precipitation - Reference Evapotranspiration	-48.1	-	-38.8
Number of Rainy Days	2.0	-	2.1
Number of Dry Days	4.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

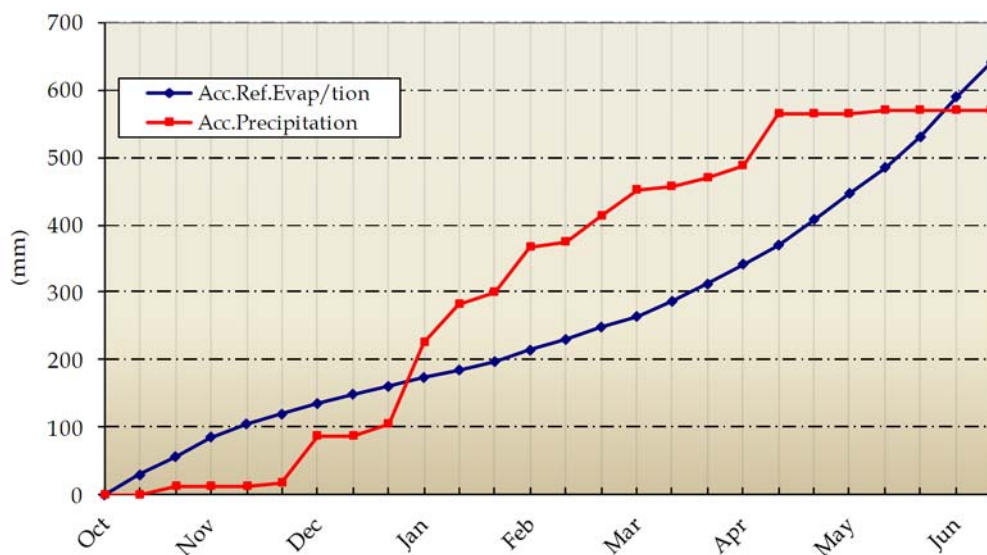


Tympaki

1st 10-day period (1-10/06/2009)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	28.8	30.4	24.6	25.0	25.0	27.0	29.0	30.0	30.4	35.6	28.6	-	27.1
	Min	16.6	17.0	16.6	20.0	14.8	15.0	17.4	19.6	20.4	21.0	17.8	-	16.3
Relative Humidity	Max	74	84	90	93	93	89	79	76	60	56	79	-	-
	Min	28	16	68	66	52	28	29	29	24	12	35	-	-
Soil Temperature at 10 cm	06 UTC	26.4	27.0	26.6	25.8	25.8	26.0	26.6	27.6	28.4	29.2	26.9	-	26.9
	12 UTC	33.0	32.4	32.2	32.6	33.0	33.0	34.0	35.2	35.0	35.6	33.6	-	32.0
Sunshine Duration		10.3	1.9	10.4	11.7	12.3	12.2	9.3	7.7	10.5	11.3	9.8	-	11.4
Precipitation													-	0.4
Evaporation		9.1	6.4	6.3	8.7	7.6	8.5	8.6	7.2	12.8	18.0	93.2	-	87.9
Growing Degrees	5	17.7	18.7	15.6	17.5	14.9	16.0	18.2	19.8	20.4	23.3	182.1	-	165.3
	10	12.7	13.7	10.6	12.5	9.9	11.0	13.2	14.8	15.4	18.3	132.1	-	115.8

1st 10-day period (1-10/06/2009)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	51.2	-	51.1
Precipitation - Reference Evapotranspiration	-51.2	-	-50.7
Number of Rainy Days	0.0	-	0.3
Number of Dry Days	37.0	-	-

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

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