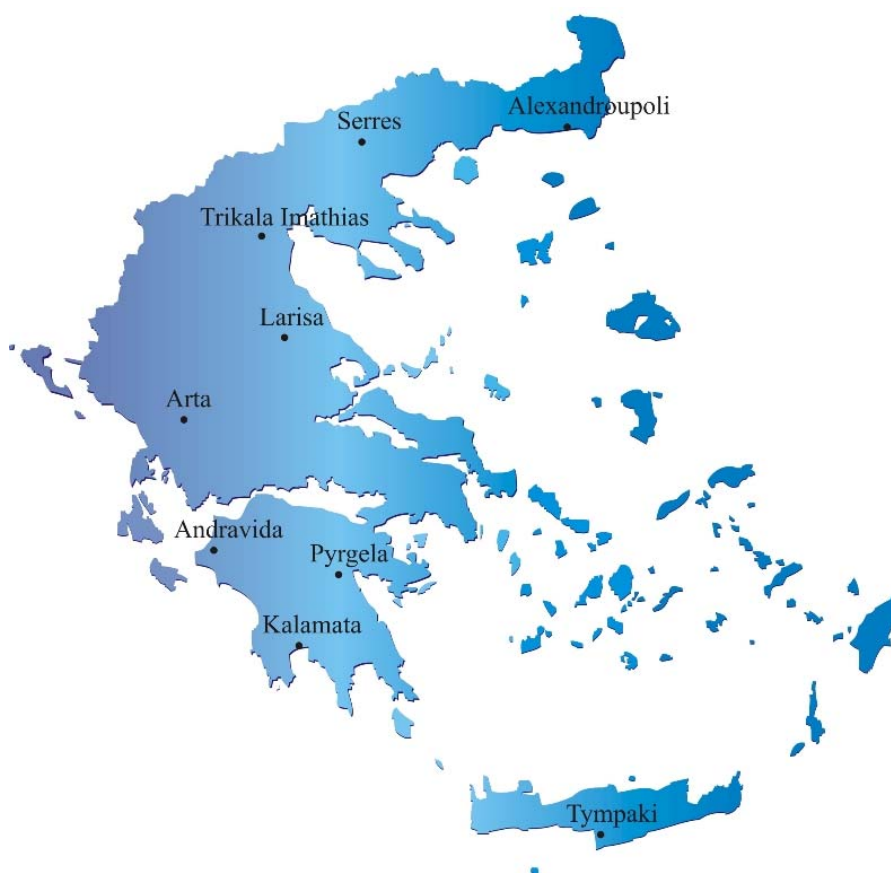




# AGROMETEOROLOGICAL BULLETIN

*June 2010*  
*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



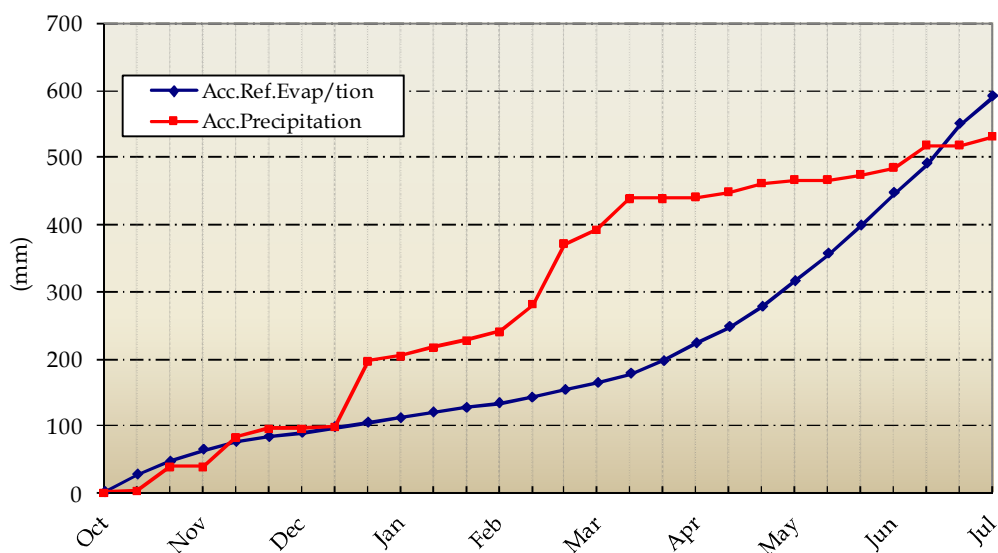
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*Web addresses of HNMS*  
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[www.meteo.gov.gr](http://www.meteo.gov.gr)  
[www.meteohellas.gr](http://www.meteohellas.gr)

3rd 10-day period (21-30/06/2010)		21	22	23	24	25	26	27	28	29	30	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	28.4	26.4	24.0	21.6	23.8	25.0	26.2	27.0	24.8	27.2	25.4	26.7	28.7
	Min	19.4	17.8	15.6	18.0	16.8	18.0	16.6	16.6	17.4	18.6	17.5	16.6	16.0
Relative Humidity	Max	91	79	98	92	83	88	90	83	94	94	89	90	-
	Min	64	38	53	60	53	52	43	52	55	50	52	52	-
Soil Temperature at 10 cm	06 UTC	26.8	26.8	24.0	23.2	20.6	21.5	22.4	23.2	23.6	22.8	23.5	24.9	23.1
	12 UTC	29.8	28.6	24.4	22.6	22.8	23.0	23.4	26.0	25.6	25.6	25.2	28.1	27.7
Sunshine Duration		12.5	11.4	1.1	0.4	7.0	6.3	12.8	6.4	4.2	10.0	7.2	9.9	10.9
Precipitation			8.6	3.6	0.8		0.0			0.5	0.3	13.8	4.7	4.4
Evaporation		6.0	8.6	2.8	3.4	4.0	4.2	8.2	8.4	-	6.1	-	68.3	85.9
Growing Degrees	5	18.9	17.1	14.8	14.8	15.3	16.5	16.4	16.8	16.1	17.9	164.6	166.7	173.3
	10	13.9	12.1	9.8	9.8	10.3	11.5	11.4	11.8	11.1	12.9	114.6	116.7	123.3

3rd 10-day period (21-30/06/2010)	Previous Year Value	Past Years Mean Value	
Reference Evapotranspiration	41.0	47.1	55.0
Precipitation - Reference Evapotranspiration	-27.2	-42.4	-50.6
Number of Rainy Days	5.0	3.0	1.3
Number of Dry Days	11.0	4.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

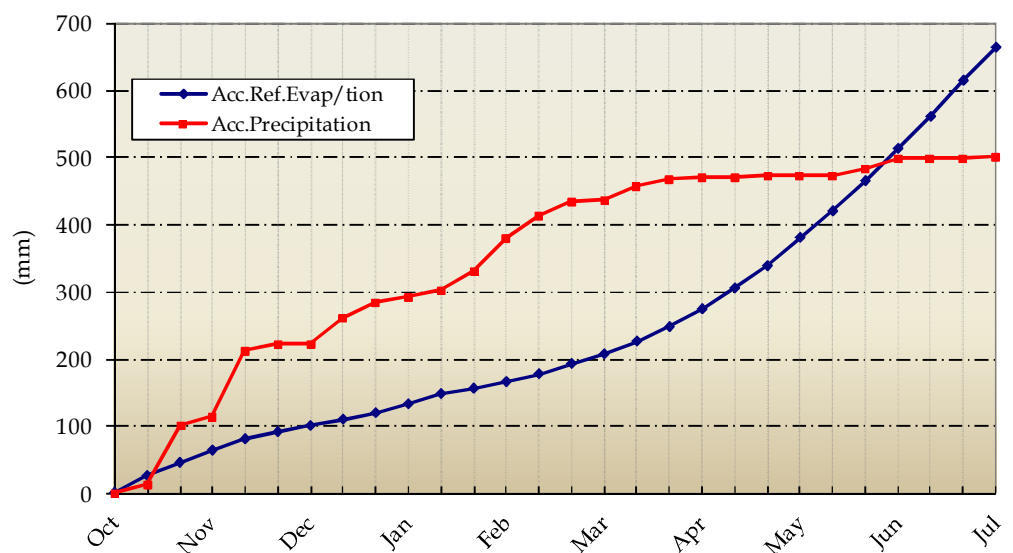


Andravida

3rd 10-day period (21-30/06/2010)		21	22	23	24	25	26	27	28	29	30	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	27.6	24.0	23.6	24.6	25.8	26.2	26.6	27.0	27.4	27.4	26.0	26.9	28.9
	Min	18.8	16.6	18.4	17.6	15.6	16.0	15.2	15.2	15.8	17.4	16.7	18.0	17.0
Relative Humidity	Max	90	90	86	88	91	89	91	90	91	96	90	93	-
	Min	48	54	59	57	49	48	41	51	45	52	50	50	-
Soil Temperature at 10 cm	06 UTC	27.4	25.0	25.0	23.6	24.0	24.4	24.8	25.0	25.4	26.4	25.1	25.7	25.9
	12 UTC	35.2	27.6	26.0	29.0	30.8	32.0	32.0	32.2	32.8	33.6	31.1	32.0	30.7
Sunshine Duration		9.1	8.1	6.9	11.2	10.8	12.8	12.9	12.8	13.0	12.0	11.0	11.8	12.3
Precipitation			0.4	1.4								1.8	5.5	1.3
Evaporation		6.1	6.5	2.6	9.2	8.0	5.7	6.6	3.0	7.5	10.1	65.3	72.4	74.3
Growing Degrees	5	18.2	15.3	16.0	16.1	15.7	16.1	15.9	16.1	16.6	17.4	163.4	174.5	179.7
	10	13.2	10.3	11.0	11.1	10.7	11.1	10.9	11.1	11.6	12.4	113.4	124.5	129.7

3rd 10-day period (21-30/06/2010)	Previous Year Value	Past Years Mean Value	
Reference Evapotranspiration	49.1	51.8	53.3
Precipitation - Reference Evapotranspiration	-47.3	-46.3	-52.0
Number of Rainy Days	2.0	2.0	0.2
Number of Dry Days	16.0	55.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

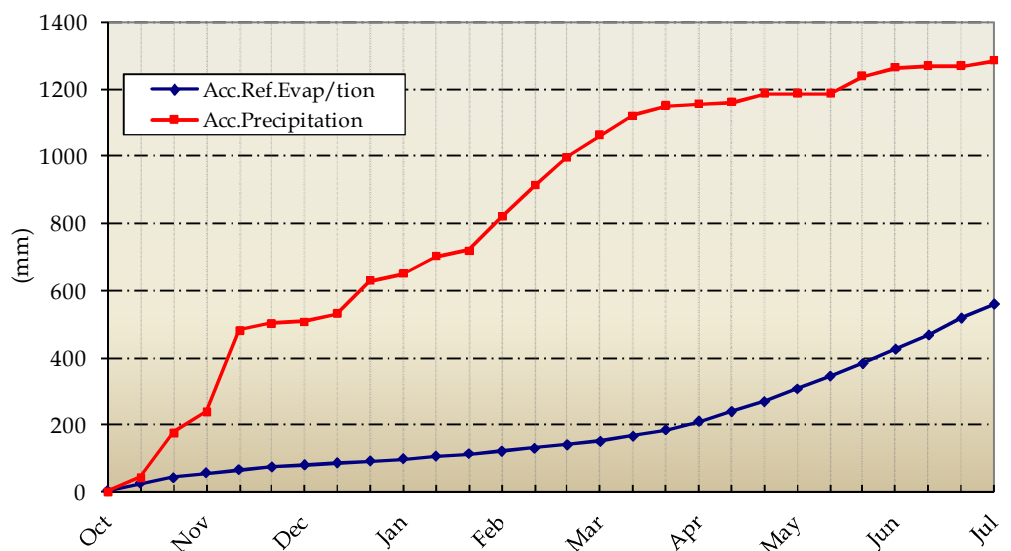




3rd 10-day period (21-30/06/2010)		21	22	23	24	25	26	27	28	29	30	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	25.4	25.0	25.6	25.6	26.0	27.2	27.0	29.0	28.4	29.8	26.9	26.5	29.8
	Min	15.6	16.6	15.6	15.0	16.6	15.2	15.8	15.2	15.8	18.4	16.0	16.4	16.2
Relative Humidity	Max	90	90	90	81	95	85	97	95	97	84	90	88	-
	Min	66	54	50	54	40	45	30	39	50	59	49	54	-
Soil Temperature at 10 cm	06 UTC	24.2	23.4	23.0	22.4	23.0	23.2	23.6	23.6	24.0	25.0	23.5	24.1	25.5
	12 UTC	26.2	27.0	26.6	25.4	25.8	26.0	26.2	26.4	26.6	27.2	26.3	25.7	31.3
Sunshine Duration		4.9	6.4	6.0	6.1	11.9	11.5	11.4	10.8	9.5	9.9	8.8	8.3	11.3
Precipitation		3.9	12.1									16.0	32.6	2.0
Evaporation		2.9	3.0	5.5	5.5	5.9	4.0	3.0	6.2	5.8	5.4	47.2	44.4	-
Growing Degrees	5	15.5	15.8	15.6	15.3	16.3	16.2	16.4	17.1	17.1	19.1	164.4	164.5	174.3
	10	10.5	10.8	10.6	10.3	11.3	11.2	11.4	12.1	12.1	14.1	114.4	114.5	125.9

3rd 10-day period (21-30/06/2010)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	42.3	40.7	49.8
Precipitation - Reference Evapotranspiration	-26.3	-8.1	-47.8
Number of Rainy Days	2.0	4.0	0.4
Number of Dry Days	15.0	18.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

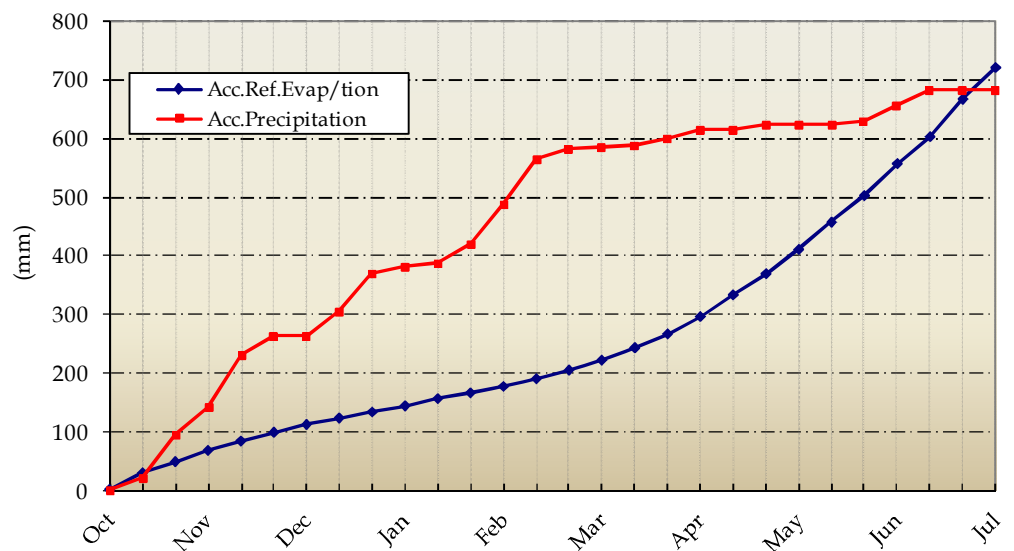


Kalamata

3rd 10-day period (21-30/06/2010)		21	22	23	24	25	26	27	28	29	30	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	29.6	25.6	24.4	26.4	26.8	27.4	28.6	25.8	27.6	28.2	27.0	28.0	30.4
	Min	16.8	16.0	16.4	17.0	16.0	16.0	16.4	17.0	15.4	17.0	16.4	17.2	16.7
Relative Humidity	Max	94	96	94	90	90	92	82	92	93	86	91	92	-
	Min	39	45	58	45	49	43	37	45	42	54	46	41	-
Soil Temperature at 10 cm	06 UTC	23.4	23.4	22.6	22.4	22.4	22.6	22.4	23.0	22.6	23.4	22.8	23.4	24.2
	12 UTC	26.0	24.6	23.2	24.6	25.0	25.2	25.2	25.4	25.2	25.6	25.0	25.8	28.7
Sunshine Duration		12.4	10.9	9.3	10.4	12.2	12.5	12.2	11.5	12.7	12.1	11.6	11.7	11.8
Precipitation			0.7	0.5								1.2	1.9	0.4
Evaporation		5.6	5.7	4.7	7.1	6.0	5.6	5.4	7.4	7.2	2.2	56.9	71.9	88.4
Growing Degrees	5	18.2	15.8	15.4	16.7	16.4	16.7	17.5	16.4	16.5	17.6	167.2	176.1	185.7
	10	13.2	10.8	10.4	11.7	11.4	11.7	12.5	11.4	11.5	12.6	117.2	126.1	135.7

3rd 10-day period (21-30/06/2010)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	54.2	52.4	58.1
Precipitation - Reference Evapotranspiration	-53.0	-50.5	-57.7
Number of Rainy Days	2.0	1.0	0.3
Number of Dry Days	16.0	20.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

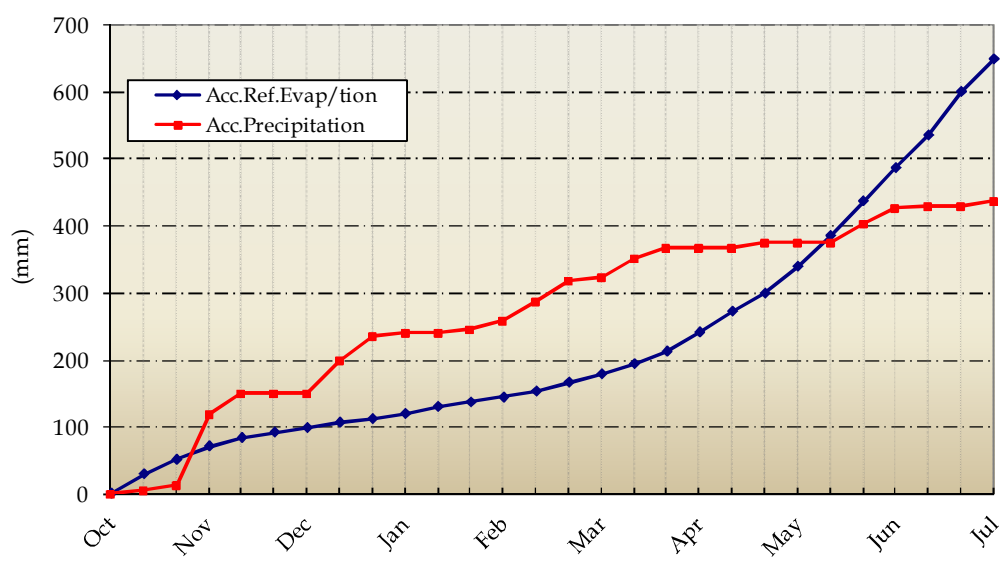


Larisa

3rd 10-day period (21-30/06/2010)		21	22	23	24	25	26	27	28	29	30	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	29.4	27.0	28.4	26.0	28.0	30.6	30.6	29.0	31.0	32.0	29.2	30.2	32.8
	Min	14.4	16.0	15.6	17.4	17.0	15.2	14.6	17.4	15.6	18.8	16.2	16.1	16.5
Relative Humidity	Max	78	72	71	65	71	73	90	94	83	81	78	89	-
	Min	30	34	33	35	25	26	29	37	32	32	31	31	-
Soil Temperature at 10 cm	06 UTC	25.0	24.2	23.0	23.4	23.2	23.4	24.0	24.8	23.8	25.0	24.0	24.5	25.0
	12 UTC	26.4	25.0	25.4	25.0	26.0	26.2	27.2	26.8	31.6	31.2	27.1	27.3	27.7
Sunshine Duration		7.2	6.4	11.7	5.8	10.0	10.4	10.1	6.5	10.3	6.9	8.5	8.9	11.1
Precipitation		3.0	0.7					1.2	1.6			6.5	4.9	6.4
Evaporation		7.5	4.2	8.8	5.5	7.7	8.5	6.5	8.5	6.8	6.8	70.8	77.5	93.9
Growing Degrees	5	16.9	16.5	17.0	16.7	17.5	17.9	17.6	18.2	18.3	20.4	177.0	181.3	196.6
	10	11.9	11.5	12.0	11.7	12.5	12.9	12.6	13.2	13.3	15.4	127.0	131.3	146.6

3rd 10-day period (21-30/06/2010)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	48.6	53.7	61.9
Precipitation - Reference Evapotranspiration	-42.1	-48.8	-55.5
Number of Rainy Days	4.0	4.0	0.9
Number of Dry Days	1.0	3.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

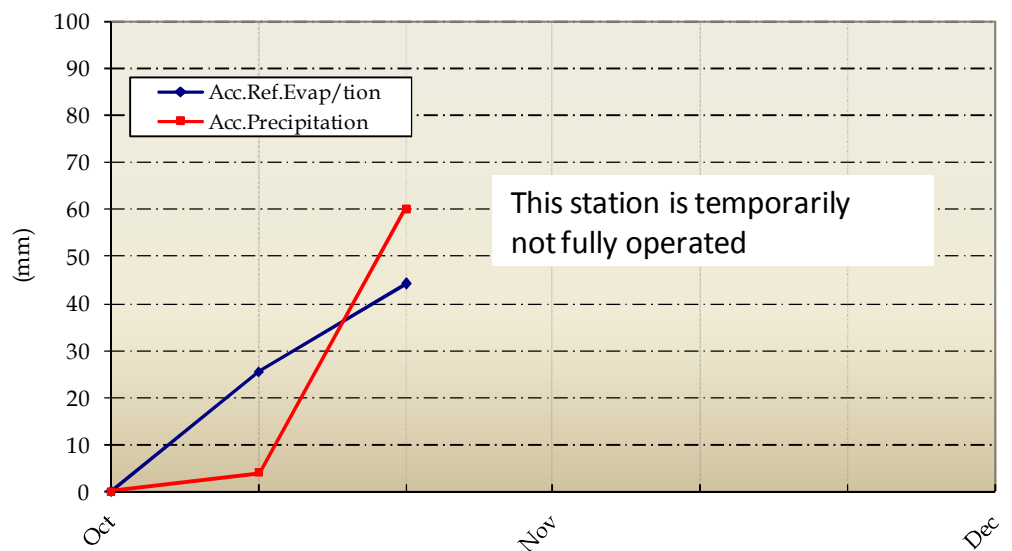


Pyrgela

3rd 10-day period (21-30/06/2010)		21	22	23	24	25	26	27	28	29	30	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	-	-	-	-	-	-	-	-	-	-	-	30.7	32.5
	Min	13.0	12.2	13.8	13.0	17.0	-	14.2	14.8	14.2	15.2	14.2	14.8	14.8
Relative Humidity	Max	45	44	46	52	-	70	63	59	66	54	55	65	-
	Min	20	30	32	32	-	33	33	33	33	29	31	36	-
Soil Temperature at 10 cm	06 UTC	27.0	27.0	25.4	24.8	26.0	-	26.4	25.0	25.6	27.0	26.0	24.0	25.0
	12 UTC	35.2	31.0	29.4	33.2	34.0	-	39.4	34.0	35.2	36.0	34.2	32.5	34.0
Sunshine Duration		11.2	9.4	7.4	7.0	-	-	8.0	8.1	8.3	7.9	8.4	10.7	11.1
Precipitation													6.3	4.2
Evaporation		6.0	7.0	4.4	6.4	-	4.0	7.6	4.0	6.6	6.0	-	65.5	71.8
Growing Degrees	5	-	-	-	-	-	-	-	-	-	-	-	177.2	185.4
	10	-	-	-	-	-	-	-	-	-	-	-	127.2	135.6

3rd 10-day period (21-30/06/2010)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	-	50.1	52.0
Precipitation - Reference Evapotranspiration	-	-43.8	-47.8
Number of Rainy Days	-	1.0	0.7
Number of Dry Days	-	45.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

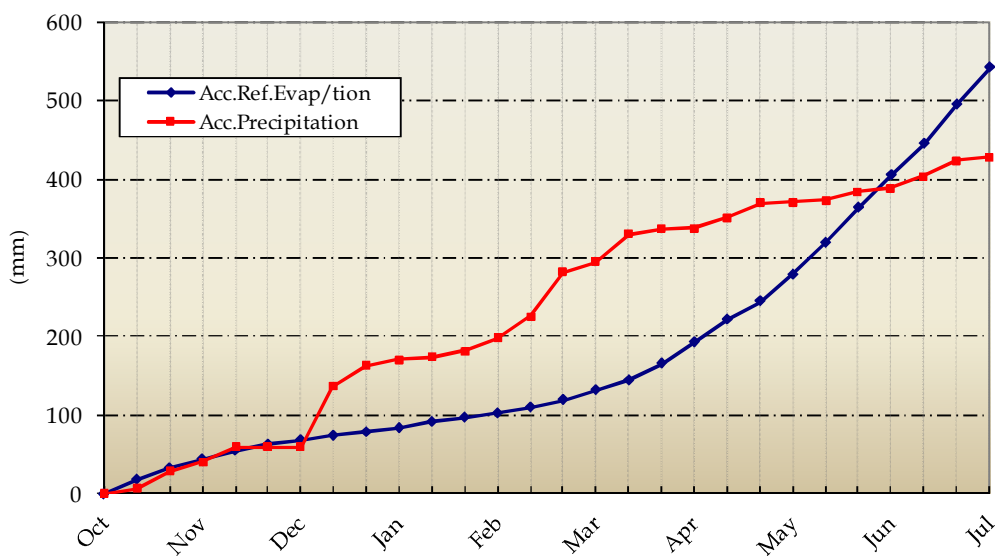


Series

3rd 10-day period (21-30/06/2010)		21	22	23	24	25	26	27	28	29	30	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	29.2	27.0	27.0	28.4	30.0	29.0	30.4	30.4	29.8	33.6	29.5	28.8	31.5
	Min	16.4	15.0	14.4	19.2	14.8	18.0	15.6	18.0	17.0	18.4	16.7	16.5	17.5
Relative Humidity	Max	94	91	60	81	78	46	63	84	77	81	76	85	-
	Min	40	32	32	30	26	30	29	31	39	27	32	42	-
Soil Temperature at 10 cm	06 UTC	28.2	22.0	21.6	22.4	22.6	23.8	23.2	24.4	23.6	24.4	23.6	21.5	24.0
	12 UTC	24.0	23.4	22.0	26.0	25.2	25.4	25.2	25.4	25.2	25.4	24.7	24.5	28.2
Sunshine Duration		6.7	8.0	10.3	4.6	10.6	10.6	8.8	7.7	7.1	10.4	8.5	7.2	10.6
Precipitation		1.4	1.6		0.2	0.5			1.6			5.3	55.3	11.1
Evaporation		2.7	2.2	7.7	3.2	4.8	4.6	5.0	4.6	6.2	4.8	45.8	33.8	70.6
Growing Degrees	5	17.8	16.0	15.7	18.8	17.4	18.5	18.0	19.2	18.4	21.0	180.8	176.6	194.9
	10	12.8	11.0	10.7	13.8	12.4	13.5	13.0	14.2	13.4	16.0	130.8	126.6	144.9

3rd 10-day period (21-30/06/2010)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	47.1	40.8	51.1
Precipitation - Reference Evapotranspiration	-41.8	14.5	-40.0
Number of Rainy Days	5.0	5.0	1.6
Number of Dry Days	0.0	2.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



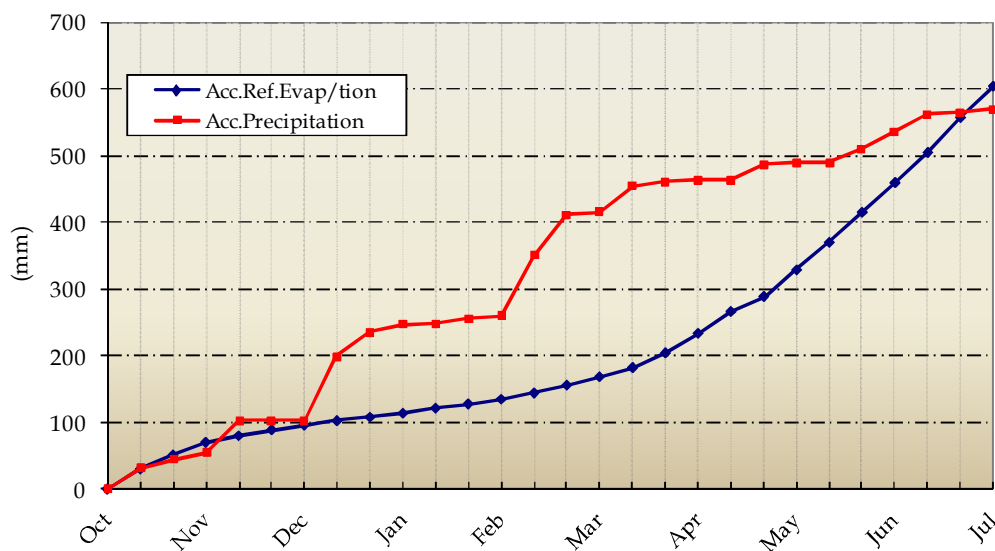


Trikala Imathias

3rd 10-day period (21-30/06/2010)		21	22	23	24	25	26	27	28	29	30	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	28.8	27.2	26.2	26.6	28.0	28.6	29.6	29.6	31.6	33.8	29.0	28.0	30.8
	Min	16.4	15.6	13.4	16.0	14.4	14.6	15.4	17.0	17.0	19.4	15.9	16.6	17.0
Relative Humidity	Max	100	94	95	80	80	90	95	94	84	96	91	92	-
	Min	49	38	42	35	33	35	35	39	42	32	38	44	-
Soil Temperature at 10 cm	06 UTC	23.6	22.4	22.0	22.8	22.0	23.0	24.0	25.0	25.2	25.8	23.6	23.5	24.2
	12 UTC	27.2	26.4	26.2	26.0	26.0	27.0	27.8	28.2	28.8	30.0	27.4	27.1	25.9
Sunshine Duration		7.4	7.1	11.0	3.6	10.0	11.0	11.1	8.6	9.8	11.7	9.1	8.0	10.5
Precipitation		4.8										4.8	30.5	9.1
Evaporation		2.0	4.8	5.0	3.8	6.2	5.4	5.4	5.8	3.6	4.2	46.2	32.8	66.6
Growing Degrees	5	17.6	16.4	14.8	16.3	16.2	16.6	17.5	18.3	19.3	21.6	174.6	173.0	189.1
	10	12.6	11.4	9.8	11.3	11.2	11.6	12.5	13.3	14.3	16.6	124.6	123.0	139.1

3rd 10-day period (21-30/06/2010)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	46.8	46.6	52.3
Precipitation - Reference Evapotranspiration	-42.0	-16.1	-43.2
Number of Rainy Days	1.0	5.0	1.0
Number of Dry Days	0.0	2.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

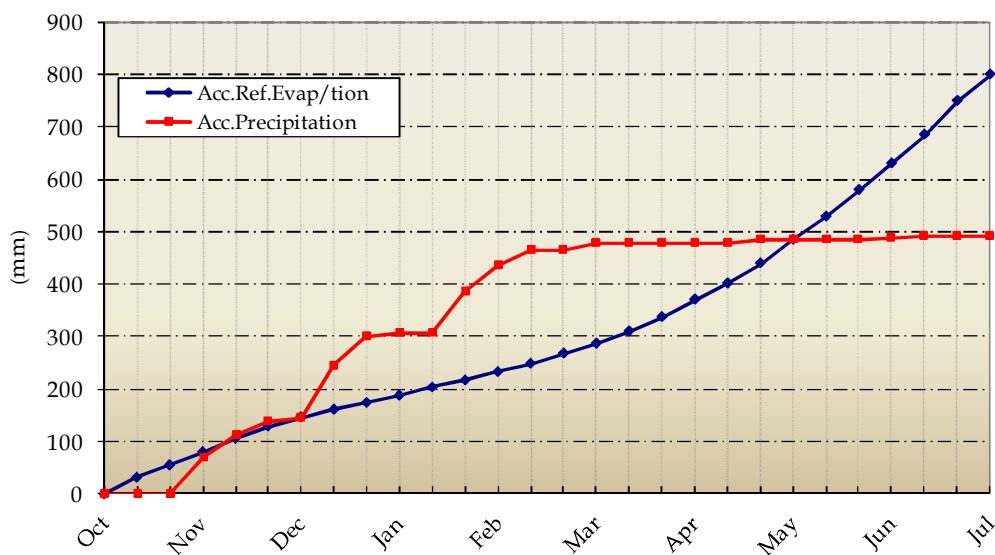


Tympaki

3rd 10-day period (21-30/06/2010)		21	22	23	24	25	26	27	28	29	30	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	27.4	26.8	24.8	25.0	25.2	24.4	24.4	26.6	26.2	26.2	25.7	26.9	30.0
	Min	18.8	19.6	17.6	18.0	17.4	16.0	15.0	17.2	17.4	18.0	17.5	18.8	18.5
Relative Humidity	Max	96	96	94	97	98	97	99	99	94	96	97	93	-
	Min	45	47	59	54	49	62	73	42	48	49	53	55	-
Soil Temperature at 10 cm	06 UTC	30.2	30.4	28.0	27.4	27.4	27.4	27.2	27.8	28.0	28.2	28.2	29.1	29.2
	12 UTC	35.6	34.4	33.0	33.4	33.2	33.2	33.2	33.4	33.6	34.6	33.8	35.1	34.1
Sunshine Duration		12.2	8.7	8.8	9.1	10.4	11.8	7.3	11.6	12.5	12.4	10.5	10.8	12.5
Precipitation														
Evaporation		11.3	12.7	8.4	8.1	7.6	7.9	7.2	7.8	8.2	7.4	86.6	83.0	97.7
Growing Degrees	5	18.1	18.2	16.2	16.5	16.3	15.2	14.7	16.9	16.8	17.1	166.0	178.5	192.5
	10	13.1	13.2	11.2	11.5	11.3	10.2	9.7	11.9	11.8	12.1	116.0	128.5	142.5

3rd 10-day period (21-30/06/2010)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	50.4	50.2	58.6
Precipitation - Reference Evapotranspiration	-50.4	-50.2	-58.6
Number of Rainy Days	0.0	0.0	0.0
Number of Dry Days	25.0	57.0	-

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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