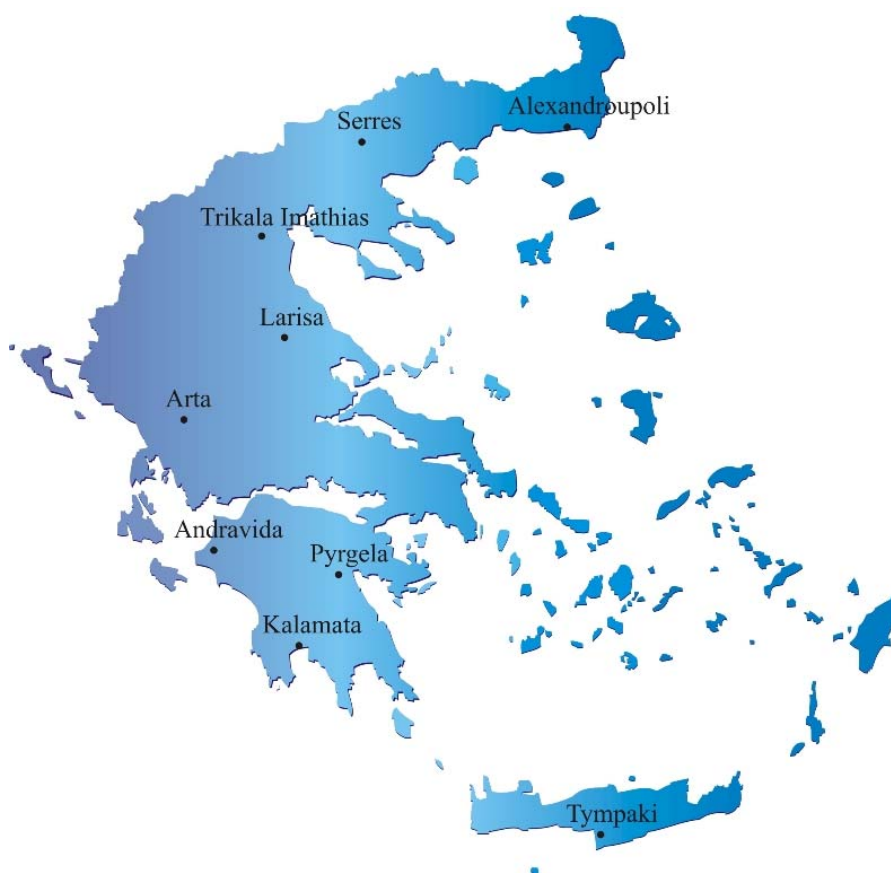




AGROMETEOROLOGICAL BULLETIN

June 2009
2nd 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



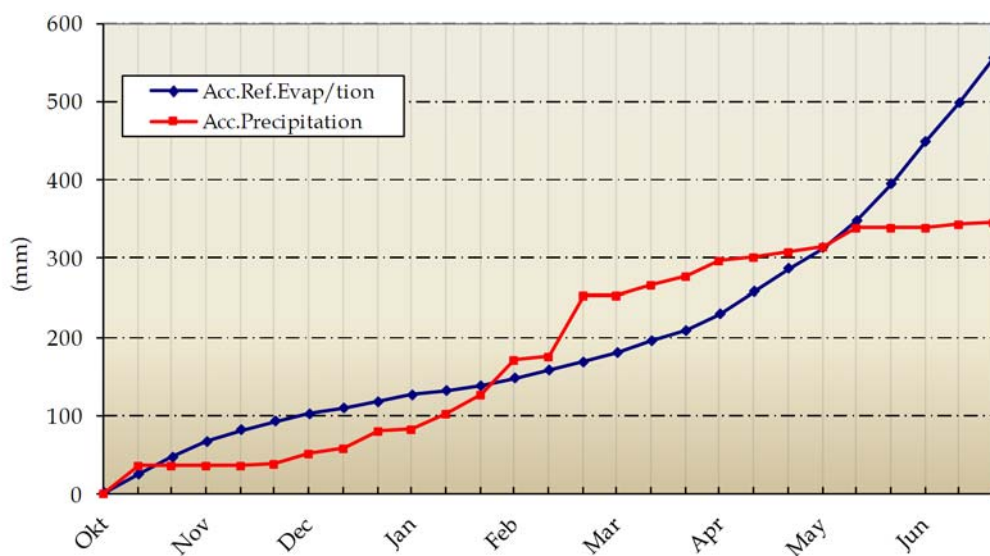
Hellenic National Meteorological Service
Division of Climatology-Applications
El. Venizelou Street 14, 16777
Helliniko, Athens

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

2nd 10-day period (11-20/06/2009)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	29.8	30.8	29.4	26.8	29.0	30.6	30.8	29.4	30.0	30.4	29.7	-	27.5
	Min	17.8	18.0	20.6	15.4	14.0	13.0	16.0	20.4	16.0	17.2	16.8	-	15.2
Relative Humidity	Max	75	81	65	73	79	83	81	82	74	84	78	-	-
	Min	40	34	15	25	25	20	39	30	26	21	28	-	-
Soil Temperature at 10 cm	06 UTC	25.6	26.2	25.0	25.0	24.4	24.4	25.0	26.2	25.0	25.2	25.2	-	22.6
	12 UTC	29.6	28.6	28.6	28.6	28.6	28.6	29.4	28.8	28.4	29.6	28.9	-	27.3
Sunshine Duration		9.1	9.4	12.8	12.2	11.9	12.5	9.3	10.9	13.0	13.1	11.4	-	10.3
Precipitation			1.9						0.2			2.1	-	11.6
Evaporation		8.5	8.7	10.7	16.0	9.5	9.0	6.7	12.6	12.7	8.7	103.1	-	79.3
Growing Degrees	5	18.8	19.4	20.0	16.1	16.5	16.8	18.4	19.9	18.0	18.8	182.7	-	163.4
	10	13.8	14.4	15.0	11.1	11.5	11.8	13.4	14.9	13.0	13.8	132.7	-	113.4

2nd 10-day period (11-20/06/2009)	Previous Year Value	Past Years Mean Value	
Reference Evapotranspiration	57.4	-	52.7
Precipitation - Reference Evapotranspiration	-55.3	-	-41.1
Number of Rainy Days	2.0	-	1.6
Number of Dry Days	7.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

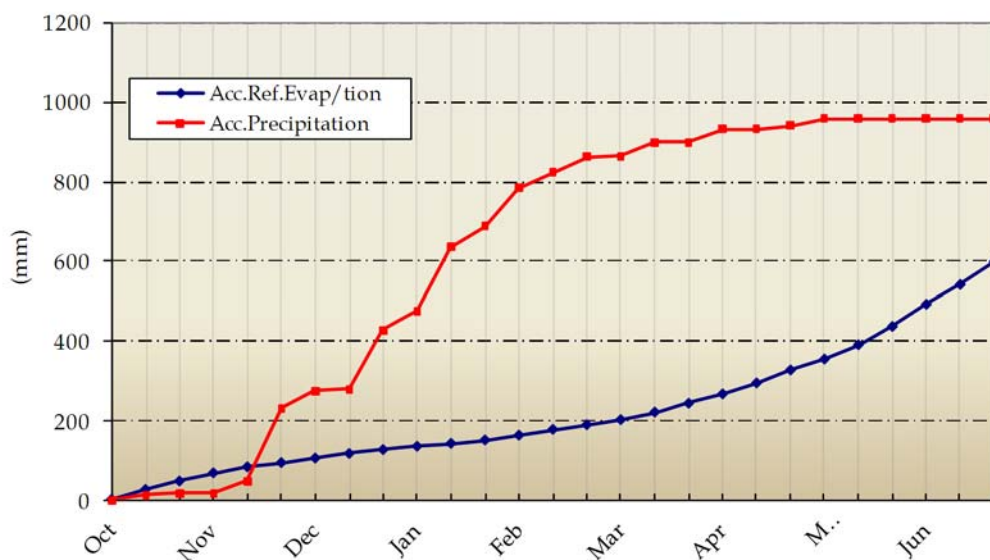


Andravida

2nd 10-day period (11-20/06/2009)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	31.2	27.2	32.4	29.2	30.0	30.2	31.8	33.8	30.6	29.4	30.6	-	28.1
	Min	18.0	16.6	17.8	18.8	16.8	16.0	16.6	18.0	19.2	19.8	17.8	-	16.4
Relative Humidity	Max	96	88	92	92	90	85	92	98	100	96	93	-	-
	Min	38	50	35	40	36	29	34	27	56	50	40	-	-
Soil Temperature at 10 cm	06 UTC	26.6	26.2	26.0	27.0	26.0	25.8	26.4	27.0	27.8	28.0	26.7	-	24.8
	12 UTC	34.4	32.8	34.0	33.8	33.8	33.2	34.0	35.2	35.6	35.4	34.2	-	29.7
Sunshine Duration		13.3	13.7	13.3	12.6	13.4	13.7	13.6	13.2	13.0	10.4	13.0	-	11.5
Precipitation													-	2.1
Evaporation		10.5	7.8	0.7	19.0	11.4	11.9	20.9	8.6	8.2	16.2	115.2	-	71.4
Growing Degrees	5	19.6	16.9	20.1	19.0	18.4	18.1	19.2	20.9	19.9	19.6	191.7	-	172.2
	10	14.6	11.9	15.1	14.0	13.4	13.1	14.2	15.9	14.9	14.6	141.7	-	122.2

2nd 10-day period (11-20/06/2009)	Previous Year Value	Past Years Mean Value	
Reference Evapotranspiration	56.9	-	50.2
Precipitation - Reference Evapotranspiration	-56.9	-	-48.1
Number of Rainy Days	0.0	-	0.4
Number of Dry Days	53.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

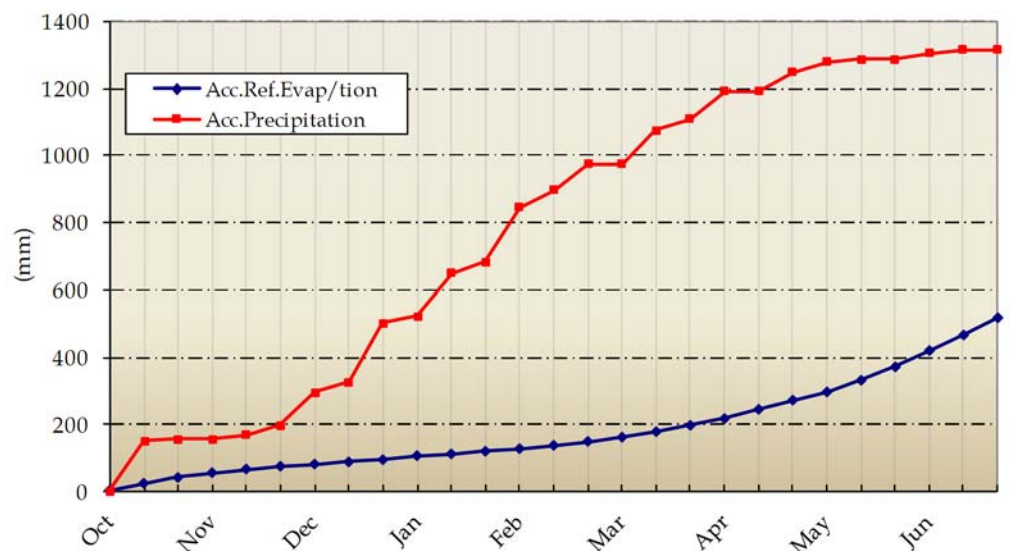


Arta

2nd 10-day period (11-20/06/2009)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	31.2	31.0	32.0	31.2	31.6	32.4	33.2	35.0	33.0	30.2	32.1	-	28.8
	Min	17.6	16.0	18.4	18.0	15.0	16.0	16.4	18.0	19.0	18.6	17.3	-	15.7
Relative Humidity	Max	82	86	82	85	76	77	82	86	75	81	81	-	-
	Min	53	43	35	40	31	34	44	36	37	55	41	-	-
Soil Temperature at 10 cm	06 UTC	25.6	25.8	26.4	26.6	26.0	26.0	26.4	27.0	27.6	27.6	26.5	-	24.3
	12 UTC	-	28.4	28.2	28.4	28.2	28.2	29.0	29.2	29.8	29.4	28.8	-	30.1
Sunshine Duration		13.1	13.0	11.3	11.9	12.0	12.1	13.0	13.0	11.1	7.4	11.8	-	10.6
Precipitation													-	8.3
Evaporation		7.0	6.0	6.0	8.3	8.9	7.9	6.4	7.9	8.0	4.8	71.2	-	-
Growing Degrees	5	19.4	18.5	20.2	19.6	18.3	19.2	19.8	21.5	21.0	19.4	196.9	-	172.3
	10	14.4	13.5	15.2	14.6	13.3	14.2	14.8	16.5	16.0	14.4	146.9	-	122.3

2nd 10-day period (11-20/06/2009)	Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	51.8	-
Precipitation - Reference Evapotranspiration	-51.8	-39.1
Number of Rainy Days	0.0	1.2
Number of Dry Days	17.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

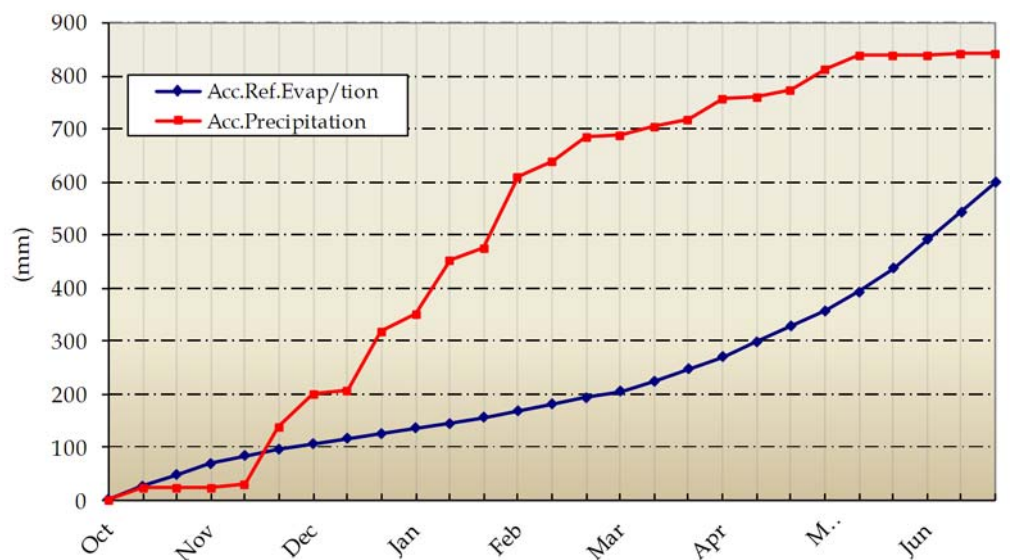


Kalamata

2nd 10-day period (11-20/06/2009)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	33.8	33.4	29.8	28.6	30.6	30.2	31.4	34.0	30.8	27.8	31.0	-	29.3
	Min	18.8	20.8	17.0	18.6	15.6	14.0	16.4	17.2	18.6	18.0	17.5	-	15.9
Relative Humidity	Max	91	81	90	94	90	92	82	88	92	95	90	-	-
	Min	32	32	46	47	23	29	37	30	45	64	38	-	-
Soil Temperature at 10 cm	06 UTC	23.0	22.8	23.0	22.8	22.4	22.4	22.6	23.4	23.4	24.4	23.0	-	23.0
	12 UTC	25.0	24.0	25.0	25.6	25.6	25.4	25.6	26.4	26.6	26.6	25.6	-	27.4
Sunshine Duration		13.0	13.0	13.0	11.7	13.3	13.1	12.0	12.9	12.0	12.4	12.6	-	11.0
Precipitation													-	3.1
Evaporation		8.0	7.0	8.0	14.0	10.0	9.0	6.0	8.0	8.0	8.0	86.0	-	80.7
Growing Degrees	5	21.3	22.1	18.4	18.6	18.1	17.1	18.9	20.6	19.7	17.9	192.7	-	175.9
	10	16.3	17.1	13.4	13.6	13.1	12.1	13.9	15.6	14.7	12.9	142.7	-	125.9

2nd 10-day period (11-20/06/2009)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	56.8	-	54.6
Precipitation - Reference Evapotranspiration	-56.8	-	-51.5
Number of Rainy Days	0.0	-	0.9
Number of Dry Days	16.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

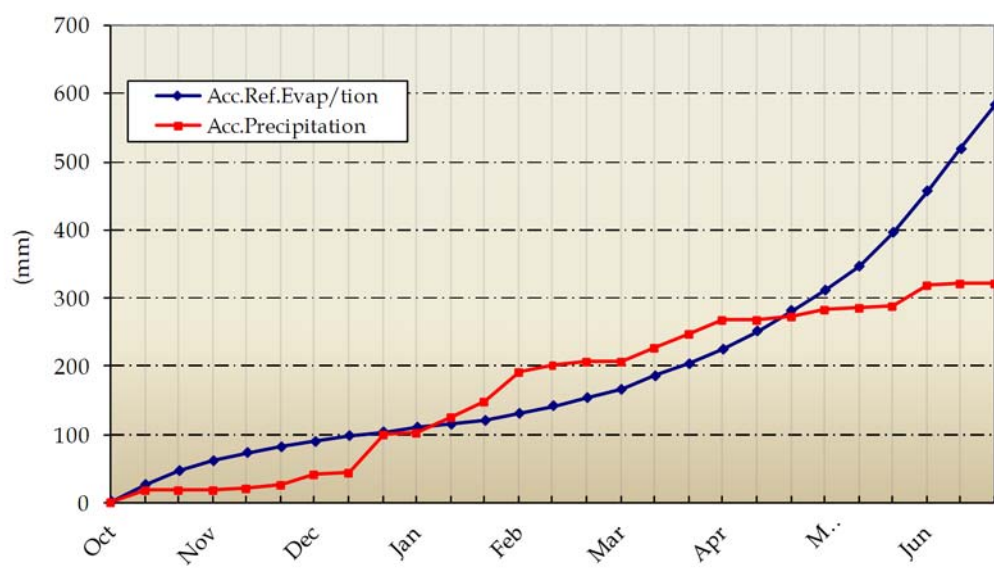


Larisa

2nd 10-day period (11-20/06/2009)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	39.0	33.0	29.2	30.0	31.4	34.2	37.0	31.0	30.6	33.4	32.9	-	31.7
	Min	18.0	18.4	22.6	13.2	13.8	14.6	16.0	23.8	16.0	17.0	17.3	-	15.7
Relative Humidity	Max	79	92	67	82	87	70	66	83	89	85	80	-	-
	Min	19	29	23	21	21	19	18	40	34	26	25	-	-
Soil Temperature at 10 cm	06 UTC	24.8	26.2	25.8	24.2	24.4	24.4	25.2	27.0	25.8	25.6	25.3	-	23.9
	12 UTC	29.0	28.6	27.8	27.2	27.4	27.8	28.4	28.0	28.2	28.8	28.1	-	26.6
Sunshine Duration		12.7	11.1	8.4	12.8	13.4	13.3	11.8	12.2	7.5	8.9	11.2	-	10.5
Precipitation										0.0	0.9	0.9	-	6.2
Evaporation		10.1	10.9	8.1	9.5	6.0	13.0	20.3	6.5	7.3	9.8	101.5	-	85.8
Growing Degrees	5	23.5	20.7	20.9	16.6	17.6	19.4	21.5	22.4	18.3	20.2	201.1	-	186.8
	10	18.5	15.7	15.9	11.6	12.6	14.4	16.5	17.4	13.3	15.2	151.1	-	136.8

2nd 10-day period (11-20/06/2009)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	64.8	-	58.5
Precipitation - Reference Evapotranspiration	-63.9	-	-52.3
Number of Rainy Days	1.0	-	1.7
Number of Dry Days	15.0	-	-

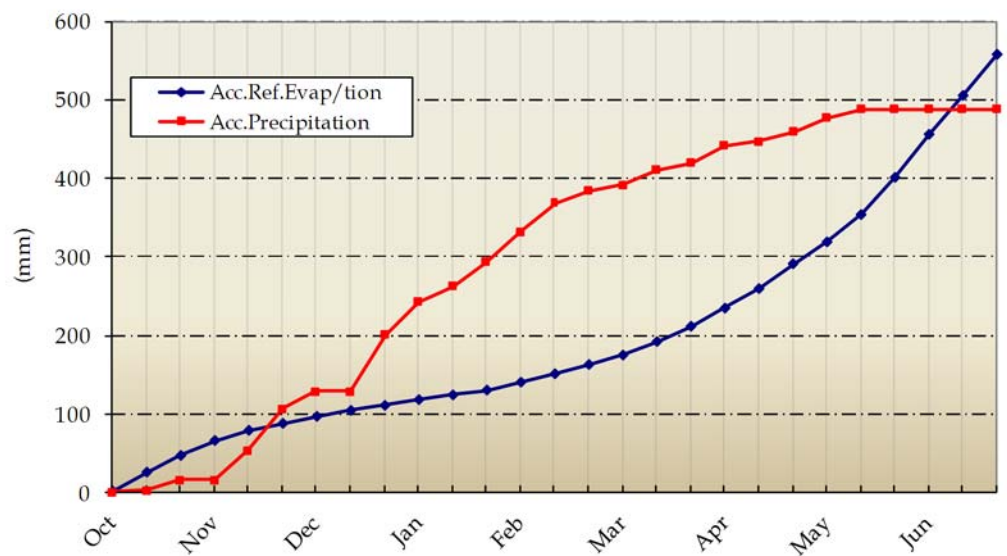
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



2nd 10-day period (11-20/06/2009)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	37.2	37.0	32.0	30.4	32.2	35.2	38.6	34.0	34.6	30.4	34.2	-	31.1
	Min	14.8	13.0	16.8	15.2	11.0	11.0	14.8	15.8	18.0	15.0	14.5	-	13.8
Relative Humidity	Max	55	67	50	60	65	45	42	70	68	89	61	-	-
	Min	24	20	34	21	20	20	19	32	31	40	26	-	-
Soil Temperature at 10 cm	06 UTC	27.4	26.6	28.0	25.8	25.0	25.0	26.2	27.2	28.0	27.0	26.6	-	24.0
	12 UTC	36.4	36.0	33.4	-	34.0	33.6	34.2	36.6	-	-	34.9	-	32.8
Sunshine Duration		12.1	12.4	7.3	12.4	12.7	10.4	12.3	8.3	9.7	5.6	10.3	-	10.6
Precipitation													-	1.6
Evaporation		5.0	9.0	6.4	4.6	7.0	9.2	6.8	5.6	4.4	3.8	61.8	-	70.1
Growing Degrees	5	21.0	20.0	19.4	17.8	16.6	18.1	21.7	19.9	21.3	17.7	193.5	-	174.5
	10	16.0	15.0	14.4	12.8	11.6	13.1	16.7	14.9	16.3	12.7	143.5	-	124.5

2nd 10-day period (11-20/06/2009)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	52.6	-	50.4
Precipitation - Reference Evapotranspiration	-52.6	-	-48.8
Number of Rainy Days	0.0	-	1.2
Number of Dry Days	45.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

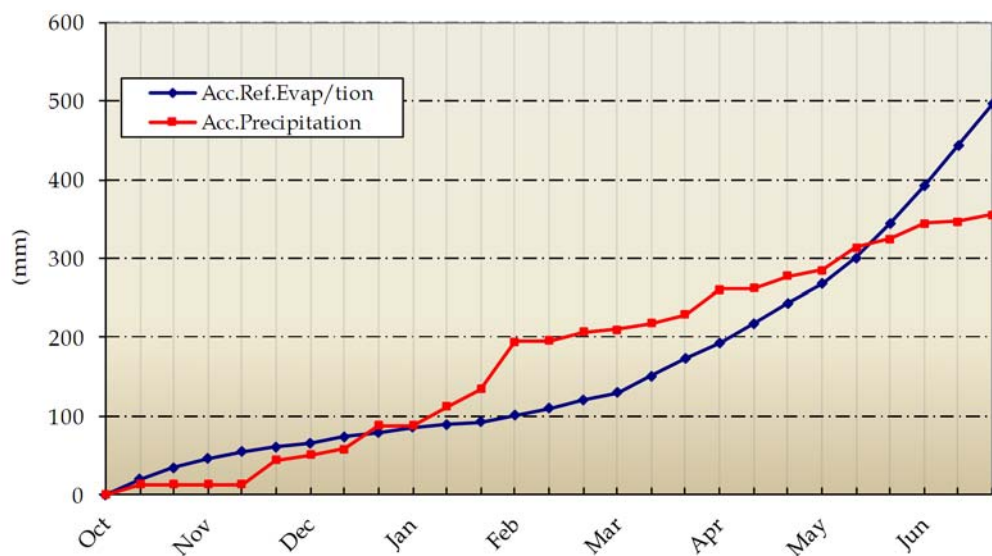


Series

2nd 10-day period (11-20/06/2009)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	36.4	33.8	31.0	30.4	34.0	34.6	38.6	29.0	32.4	32.4	33.3	-	30.1
	Min	19.4	18.6	18.0	16.4	15.0	16.0	16.0	19.2	18.4	18.0	17.5	-	16.9
Relative Humidity	Max	68	61	45	45	56	54	52	92	71	60	60	-	-
	Min	26	27	18	17	17	24	21	55	31	30	27	-	-
Soil Temperature at 10 cm	06 UTC	25.4	25.4	25.2	25.0	24.6	25.2	25.4	27.0	25.2	24.6	25.3	-	23.1
	12 UTC	28.0	27.4	27.6	-	26.6	26.6	27.0	26.4	26.2	27.0	27.0	-	27.0
Sunshine Duration		11.0	11.7	12.4	13.0	10.0	11.2	12.3	3.0	12.7	10.0	10.7	-	9.7
Precipitation		1.6							7.5			9.1	-	13.8
Evaporation		3.0	3.0	3.0	3.0	4.2	3.2	3.9	1.2	5.0	0.7	30.2	-	66.8
Growing Degrees	5	22.9	21.2	19.5	18.4	19.5	20.3	22.3	19.1	20.4	20.2	203.8	-	185.2
	10	17.9	16.2	14.5	13.4	14.5	15.3	17.3	14.1	15.4	15.2	153.8	-	135.2

2nd 10-day period (11-20/06/2009)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	53.3	-	48.5
Precipitation - Reference Evapotranspiration	-44.2	-	-34.7
Number of Rainy Days	2.0	-	2.4
Number of Dry Days	6.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

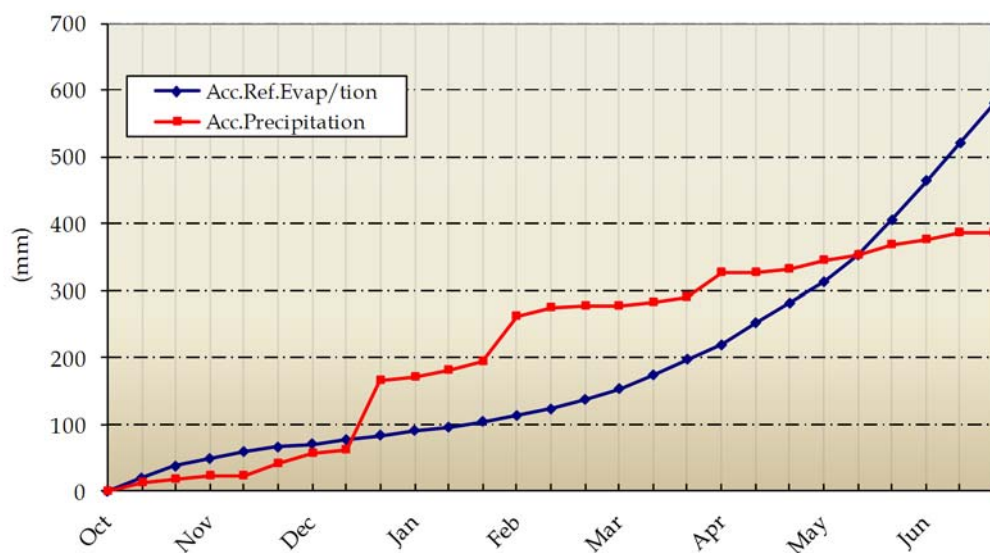


Trikala Imathias

2nd 10-day period (11-20/06/2009)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	34.0	31.6	28.6	30.6	30.4	30.6	37.8	35.0	29.6	29.4	31.8	-	29.6
	Min	19.2	19.0	17.0	14.8	15.0	15.0	17.4	20.2	17.4	18.4	17.3	-	16.3
Relative Humidity	Max	92	80	51	91	86	94	87	94	93	91	86	-	-
	Min	38	25	21	25	29	32	27	70	33	43	34	-	-
Soil Temperature at 10 cm	06 UTC	26.4	26.4	25.2	24.6	25.0	25.2	26.0	27.6	24.2	25.6	25.6	-	23.4
	12 UTC	30.6	30.2	28.8	27.4	30.0	30.0	35.0	27.6	29.0	28.8	29.7	-	25.1
Sunshine Duration		12.2	11.7	10.5	12.7	11.8	12.2	12.3	0.0	11.8	10.8	10.6	-	9.7
Precipitation									0.9			0.9	-	9.0
Evaporation		6.0	11.2	7.3	6.1	6.2	5.8	7.6	2.0	4.8	5.8	62.8	-	63.6
Growing Degrees	5	21.6	20.3	17.8	17.7	17.7	17.8	22.6	22.6	18.5	18.9	195.5	-	179.2
	10	16.6	15.3	12.8	12.7	12.7	12.8	17.6	17.6	13.5	13.9	145.5	-	129.2

2nd 10-day period (11-20/06/2009)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	59.8	-	50.0
Precipitation - Reference Evapotranspiration	-58.9	-	-41.0
Number of Rainy Days	1.0	-	2.0
Number of Dry Days	13.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

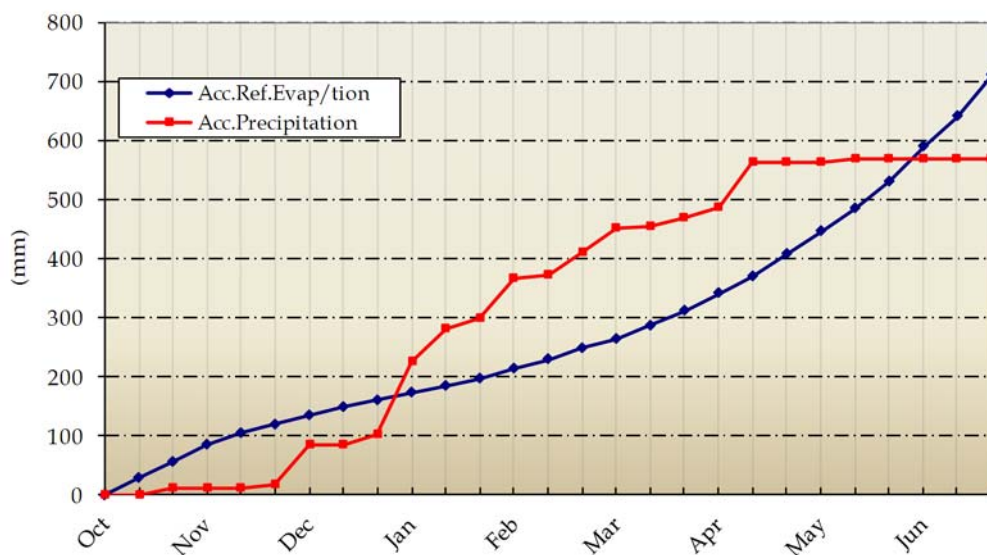


Tympaki

2nd 10-day period (11-20/06/2009)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	37.0	29.0	33.0	31.0	31.4	31.6	34.0	36.6	31.4	31.4	32.6	-	28.8
	Min	22.6	17.8	21.6	19.0	17.0	14.4	15.6	27.6	20.4	20.0	19.6	-	17.7
Relative Humidity	Max	69	93	78	57	46	48	43	51	64	74	62	-	-
	Min	11	56	29	18	18	21	19	24	20	23	24	-	-
Soil Temperature at 10 cm	06 UTC	30.0	29.6	29.8	29.6	28.2	27.0	27.6	29.6	30.0	28.6	29.0	-	28.7
	12 UTC	35.6	36.0	36.0	34.6	33.4	33.2	35.0	36.4	35.0	35.4	35.1	-	33.6
Sunshine Duration		12.4	11.5	10.1	12.4	13.0	11.8	11.6	11.0	12.1	12.0	11.8	-	12.2
Precipitation													-	0.0
Evaporation		14.9	6.7	13.2	13.8	15.2	14.7	12.5	13.9	15.6	8.1	128.6	-	98.1
Growing Degrees	5	24.8	18.4	22.3	20.0	19.2	18.0	19.8	27.1	20.9	20.7	211.2	-	182.4
	10	19.8	13.4	17.3	15.0	14.2	13.0	14.8	22.1	15.9	15.7	161.2	-	132.4

2nd 10-day period (11-20/06/2009)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	69.7	-	55.6
Precipitation - Reference Evapotranspiration	-69.7	-	-55.6
Number of Rainy Days	0.0	-	0.0
Number of Dry Days	47.0	-	-

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

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