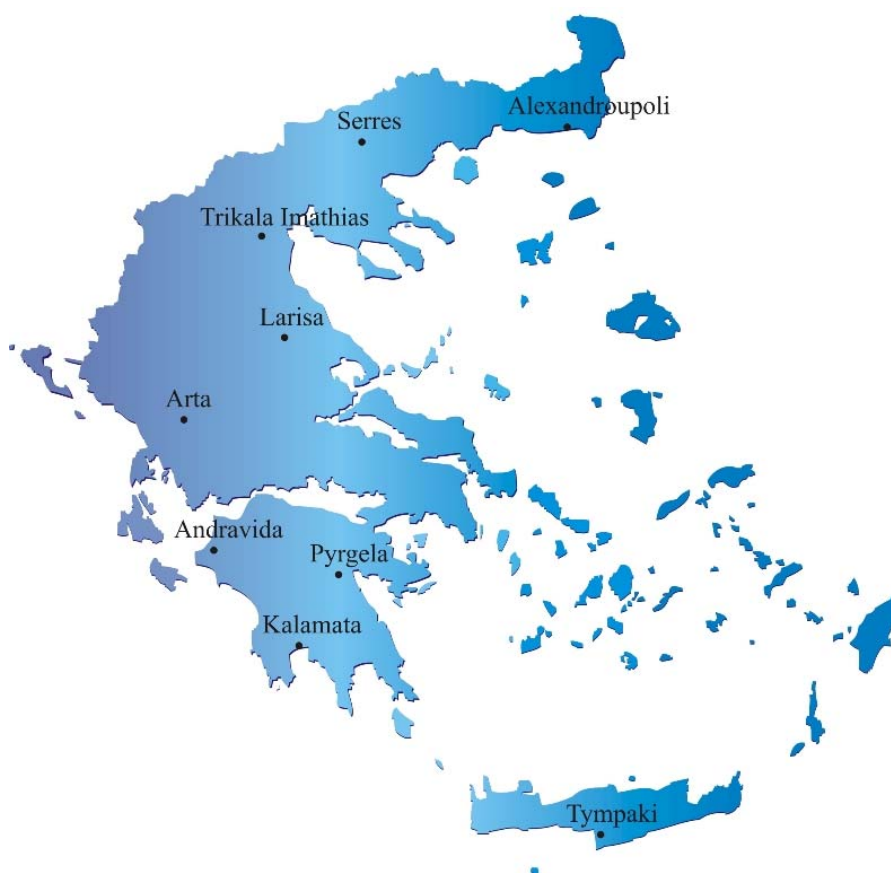




AGROMETEOROLOGICAL BULLETIN

August 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



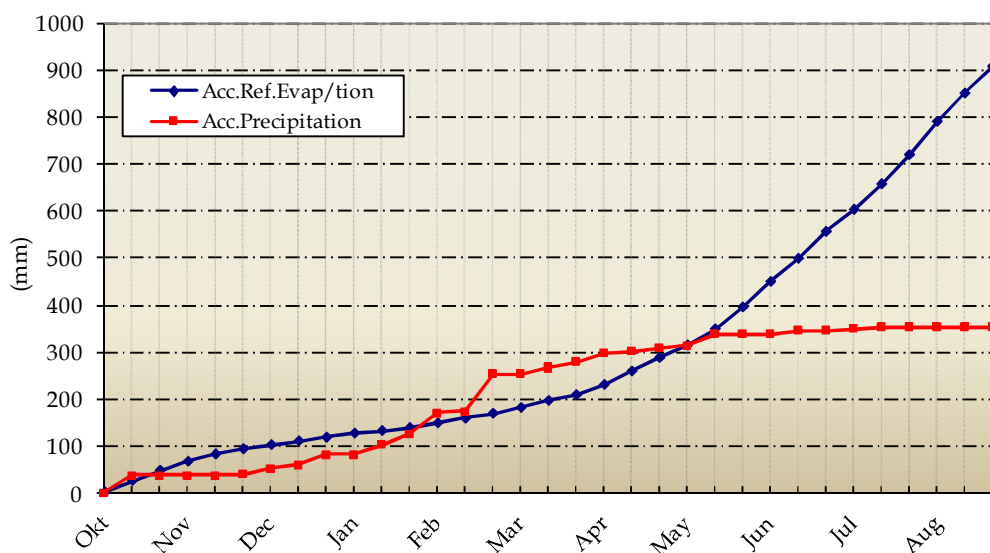
Hellenic National Meteorological Service
Division of Climatology-Applications
El. Venizelou Street 14, 16777
Helliniko, Athens

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

2nd 10-day period (11-20/08/2009)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	30.2	29.6	30.4	31.8	33.6	32.4	32.8	33.4	34.4	34.2	32.3	-	30.5
	Min	18.0	18.8	16.8	16.8	17.8	21.8	21.8	17.8	16.4	23.6	19.0	-	17.7
Relative Humidity	Max	76	81	79	86	79	82	67	78	78	48	75	-	-
	Min	26	32	29	31	32	37	36	26	23	21	29	-	-
Soil Temperature at 10 cm	06 UTC	26.4	26.6	25.5	26.0	26.6	27.4	27.2	26.6	26.6	27.4	26.6	-	23.8
	12 UTC	29.4	29.6	29.5	29.6	29.8	29.8	30.0	30.0	30.2	30.6	29.8	-	27.9
Sunshine Duration		11.3	9.5	12.5	11.3	11.6	12.0	11.1	12.4	12.5	12.6	11.7	-	10.0
Precipitation													-	3.9
Evaporation		9.2	14.1	7.9	9.6	11.3	8.1	10.9	7.6	13.1	15.2	107.0	-	94.5
Growing Degrees	5	19.1	19.2	18.6	19.3	20.7	22.1	22.3	20.6	20.4	23.9	206.2	-	191.3
	10	14.1	14.2	13.6	14.3	15.7	17.1	17.3	15.6	15.4	18.9	156.2	-	141.3

2nd 10-day period (11-20/08/2009)	Previous Year Value	Past Years Mean Value	
Reference Evapotranspiration	56.7	-	55.4
Precipitation - Reference Evapotranspiration	-56.7	-	-51.5
Number of Rainy Days	0.0	-	1.0
Number of Dry Days	41.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

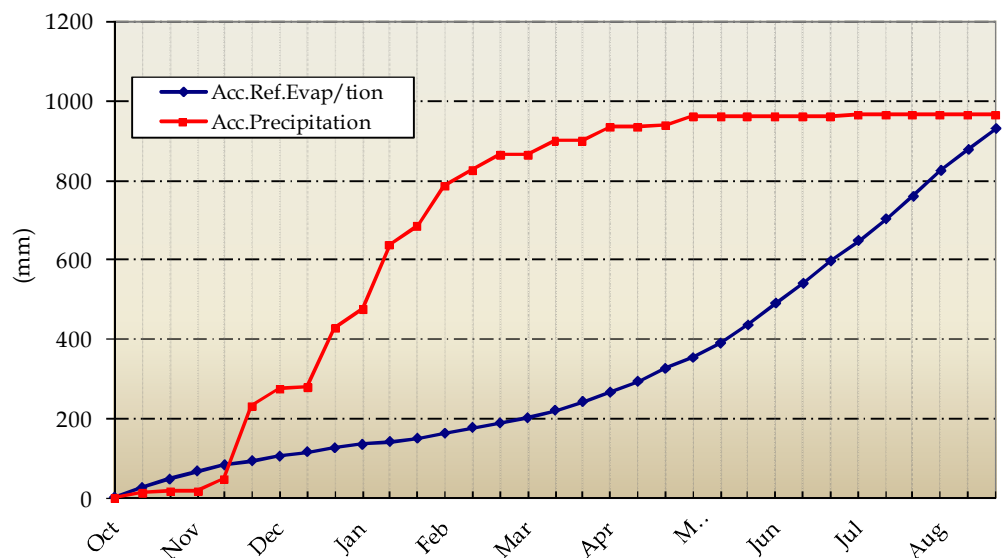


Andravida

2nd 10-day period (11-20/08/2009)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	31.6	31.0	30.8	30.4	30.0	32.4	32.6	32.8	34.0	37.4	32.3	-	31.2
	Min	20.8	21.8	20.4	21.0	20.0	19.8	20.0	19.0	18.6	21.2	20.3	-	18.7
Relative Humidity	Max	93	95	88	91	93	89	85	86	90	82	89	-	-
	Min	38	40	34	45	46	37	32	32	32	14	35	-	-
Soil Temperature at 10 cm	06 UTC	29.0	29.8	29.0	29.4	28.8	28.4	28.0	27.8	28.0	28.0	28.6	-	27.4
	12 UTC	36.4	36.0	36.2	35.6	35.2	34.2	34.2	35.2	34.4	34.8	35.2	-	31.7
Sunshine Duration		11.8	11.0	11.9	10.1	11.3	11.1	11.5	11.6	11.0	11.4	11.3	-	11.2
Precipitation													-	4.0
Evaporation		14.9	10.3	6.8	7.2	6.1	9.8	10.0	7.1	9.5	14.9	96.6	-	73.5
Growing Degrees	5	21.2	21.4	20.6	20.7	20.0	21.1	21.3	20.9	21.3	24.3	212.8	-	199.2
	10	16.2	16.4	15.6	15.7	15.0	16.1	16.3	15.9	16.3	19.3	162.8	-	149.2

2nd 10-day period (11-20/08/2009)	Previous Year Value	Past Years Mean Value	
Reference Evapotranspiration	52.5	-	49.2
Precipitation - Reference Evapotranspiration	-52.5	-	-45.2
Number of Rainy Days	0.0	-	0.3
Number of Dry Days	57.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

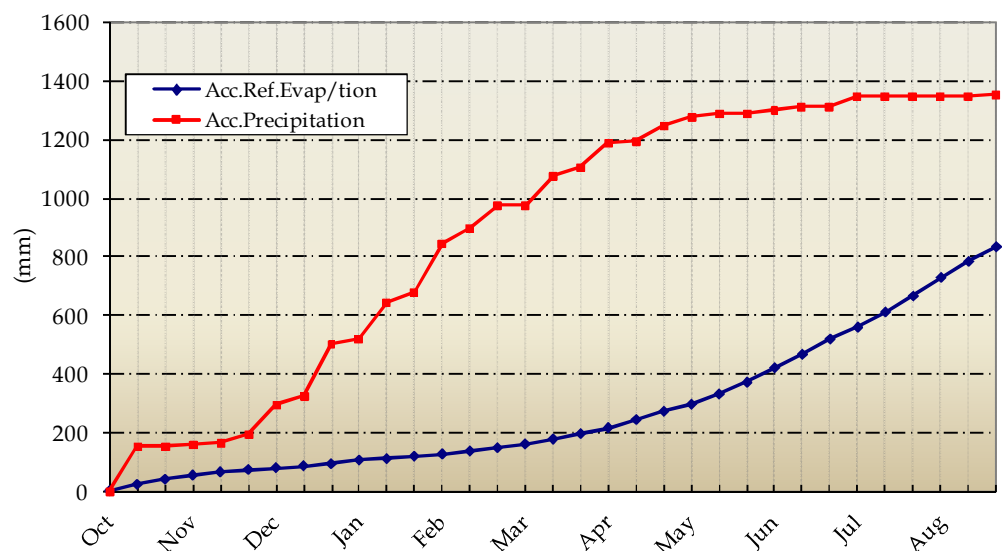


Arta

2nd 10-day period (11-20/08/2009)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	31.0	31.4	32.0	32.0	32.6	35.0	36.0	35.0	36.2	35.8	33.7	-	32.0
	Min	20.8	20.0	19.0	20.4	17.8	18.6	20.0	19.4	19.2	20.0	19.5	-	18.0
Relative Humidity	Max	99	99	99	98	98	86	96	88	76	80	92	-	-
	Min	39	45	33	36	33	23	25	34	30	18	32	-	-
Soil Temperature at 10 cm	06 UTC	29.4	29.8	28.6	28.4	28.0	27.6	27.2	28.0	28.0	28.4	28.3	-	26.6
	12 UTC	31.0	32.0	30.0	30.0	33.0	29.2	29.2	29.8	30.2	30.4	30.5	-	31.0
Sunshine Duration		12.0	9.3	11.7	9.0	10.8	10.5	11.2	11.3	11.5	12.2	11.0	-	10.1
Precipitation			2.0			3.3						5.3	-	3.2
Evaporation		5.5	6.0	6.0	5.9	6.3	6.2	5.9	7.6	7.1	8.1	64.6	-	-
Growing Degrees	5	20.9	20.7	20.5	21.2	20.2	21.8	23.0	22.2	22.7	22.9	216.1	-	199.3
	10	15.9	15.7	15.5	16.2	15.2	16.8	18.0	17.2	17.7	17.9	166.1	-	149.5

2nd 10-day period (11-20/08/2009)	Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	49.5	45.1
Precipitation - Reference Evapotranspiration	-44.2	-41.9
Number of Rainy Days	2.0	0.7
Number of Dry Days	37.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

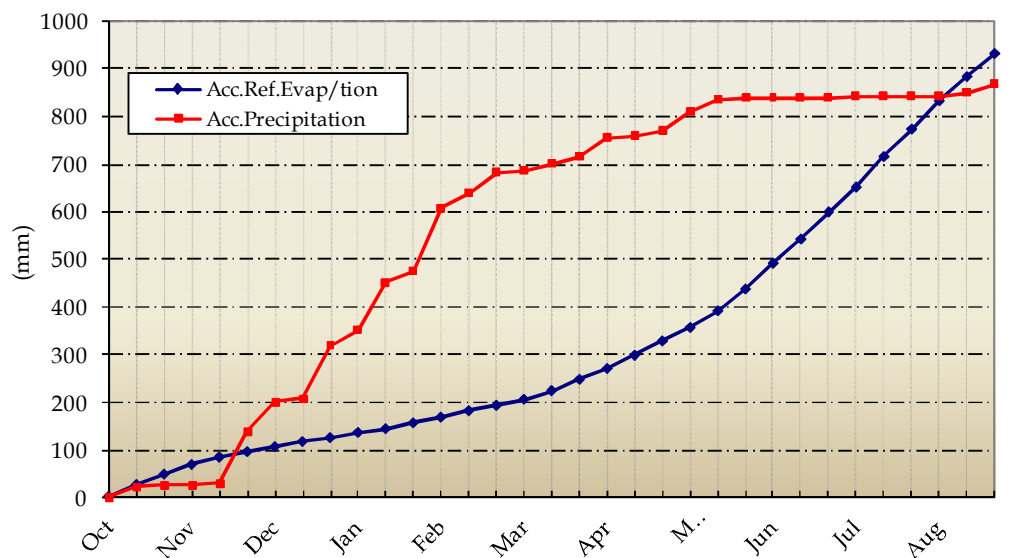


Kalamata

2nd 10-day period (11-20/08/2009)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	29.4	29.2	28.8	29.2	30.8	32.8	31.6	31.6	32.8	34.2	31.0	-	31.4
	Min	19.8	19.6	19.0	19.6	21.0	23.4	19.8	19.4	21.2	19.4	20.2	-	18.2
Relative Humidity	Max	92	96	96	92	91	78	86	94	77	82	88	-	-
	Min	58	53	56	58	40	37	38	38	32	27	44	-	-
Soil Temperature at 10 cm	06 UTC	24.0	25.4	25.2	25.4	25.0	25.4	25.2	25.4	25.4	25.2	25.2	-	25.7
	12 UTC	27.4	27.6	26.6	26.8	27.0	26.8	27.0	27.0	27.2	27.4	27.1	-	29.6
Sunshine Duration		10.0	8.1	11.1	9.9	11.5	10.3	12.0	11.5	12.2	12.2	10.9	-	10.6
Precipitation			19.7				0.0					19.7	-	3.9
Evaporation		7.0	6.7	8.0	7.0	7.0	9.0	6.0	8.0	11.0	6.0	75.7	-	78.6
Growing Degrees	5	19.6	19.4	18.9	19.4	20.9	23.1	20.7	20.5	22.0	21.8	206.3	-	198.2
	10	14.6	14.4	13.9	14.4	15.9	18.1	15.7	15.5	17.0	16.8	156.3	-	148.2

2nd 10-day period (11-20/08/2009)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	48.7	-	50.7
Precipitation - Reference Evapotranspiration	-29.0	-	-46.8
Number of Rainy Days	1.0	-	0.7
Number of Dry Days	3.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

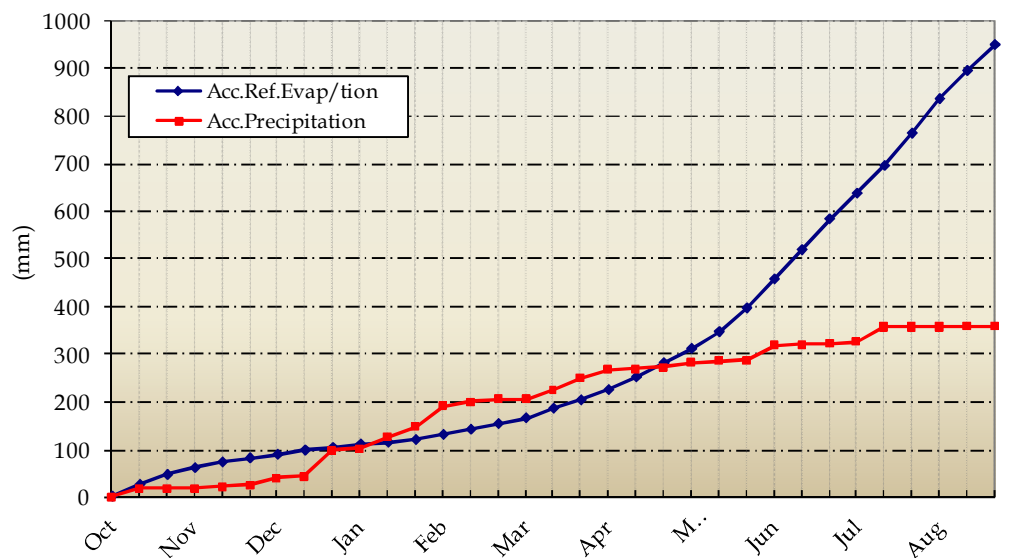


Larisa

2nd 10-day period (11-20/08/2009)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	30.6	26.4	30.0	33.4	32.4	33.4	32.8	33.0	35.0	33.8	32.1	-	32.3
	Min	17.8	18.8	17.0	17.8	19.2	20.2	21.0	19.4	19.4	21.4	19.2	-	17.5
Relative Humidity	Max	92	94	90	80	88	79	70	67	73	67	80	-	-
	Min	36	57	38	26	31	30	31	30	27	21	33	-	-
Soil Temperature at 10 cm	06 UTC	27.4	27.2	26.0	26.2	27.0	28.6	27.2	27.2	27.2	27.8	27.2	-	26.4
	12 UTC	29.8	28.0	28.8	28.8	29.2	29.4	29.8	29.8	30.0	30.2	29.4	-	28.7
Sunshine Duration		10.5	4.9	11.8	10.2	9.7	9.5	11.4	11.2	11.5	11.9	10.3	-	9.9
Precipitation		1.4	0.3		0.0							1.7	-	6.2
Evaporation		7.0	10.1	2.1	9.0	6.6	8.1	14.7	7.5	10.0	11.2	86.3	-	84.1
Growing Degrees	5	19.2	17.6	18.5	20.6	20.8	21.8	21.9	21.2	22.2	22.6	206.4	-	199.1
	10	14.2	12.6	13.5	15.6	15.8	16.8	16.9	16.2	17.2	17.6	156.4	-	149.1

2nd 10-day period (11-20/08/2009)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	54.4	-	53.3
Precipitation - Reference Evapotranspiration	-52.7	-	-47.1
Number of Rainy Days	2.0	-	1.4
Number of Dry Days	3.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

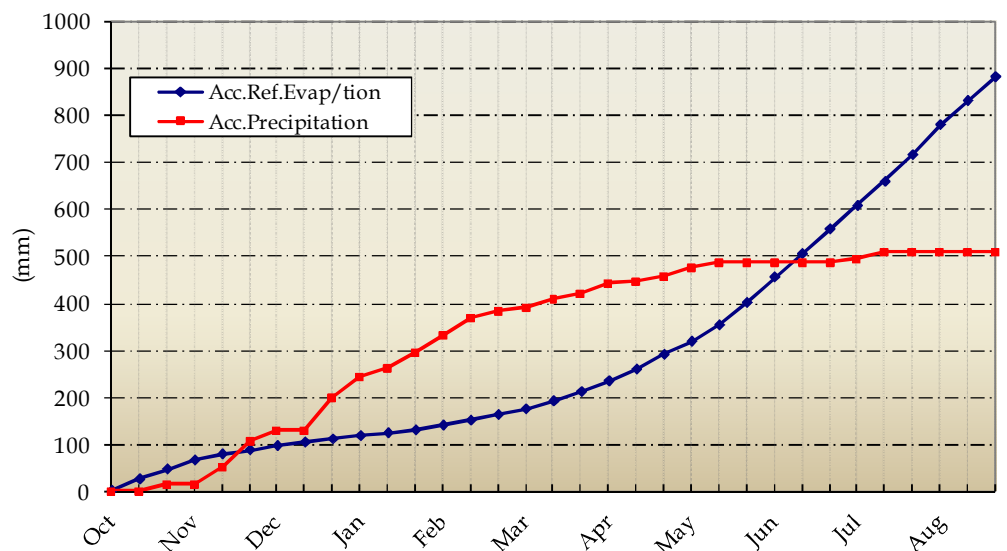


Pyrgela

2nd 10-day period (11-20/08/2009)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	32.0	30.4	33.4	34.0	35.2	32.4	34.0	35.4	36.0	35.4	33.8	-	33.6
	Min	17.8	17.6	18.4	16.8	17.2	20.2	22.8	17.8	17.6	23.0	18.9	-	17.0
Relative Humidity	Max	66	70	70	76	-	57	42	70	59	38	61	-	-
	Min	41	47	26	26	-	31	23	27	24	19	29	-	-
Soil Temperature at 10 cm	06 UTC	28.0	27.4	26.4	27.2	27.4	28.4	27.4	27.4	27.2	28.4	27.5	-	26.0
	12 UTC	35.6	35.0	34.0	35.4	35.8	34.6	34.4	35.0	34.6	34.8	34.9	-	33.8
Sunshine Duration		10.0	6.8	10.9	10.7	9.7	11.5	11.6	10.8	11.5	11.5	10.5	-	10.0
Precipitation													-	7.5
Evaporation		6.8	3.9	5.7	8.5	7.0	8.9	13.0	8.4	9.7	7.9	79.8	-	64.9
Growing Degrees	5	19.9	19.0	20.9	20.4	21.2	21.3	23.4	21.6	21.8	24.2	213.7	-	202.8
	10	14.9	14.0	15.9	15.4	16.2	16.3	18.4	16.6	16.8	19.2	163.7	-	152.8

2nd 10-day period (11-20/08/2009)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	50.8	-	47.9
Precipitation - Reference Evapotranspiration	-50.8	-	-40.4
Number of Rainy Days	0.0	-	1.0
Number of Dry Days	45.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

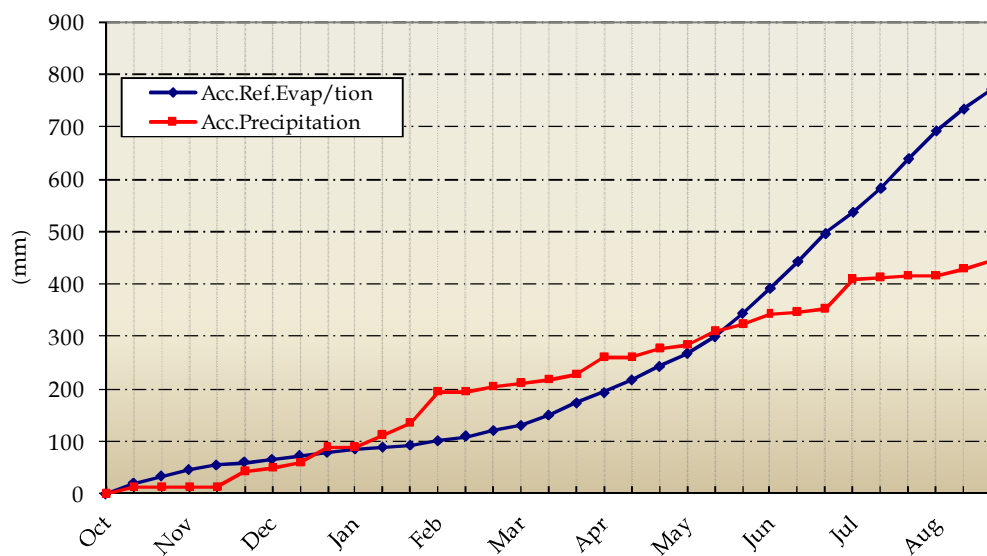


Series

2nd 10-day period (11-20/08/2009)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	26.6	28.4	32.0	32.6	32.2	32.2	34.6	34.6	36.0	35.6	32.5	-	32.0
	Min	18.0	17.2	17.0	19.4	21.2	19.6	19.6	19.6	19.4	19.8	19.1	-	18.0
Relative Humidity	Max	81	94	80	78	79	79	75	77	84	79	81	-	-
	Min	58	54	39	39	39	36	35	32	30	32	39	-	-
Soil Temperature at 10 cm	06 UTC	24.6	23.4	23.2	24.4	25.8	25.4	24.8	25.2	25.6	25.6	24.8	-	25.4
	12 UTC	25.4	25.0	26.4	27.4	27.2	28.4	27.6	28.4	28.4	28.6	27.3	-	28.7
Sunshine Duration		0.1	1.8	11.2	7.8	2.6	5.2	10.1	11.1	7.4	10.8	6.8	-	9.8
Precipitation			10.9				3.5			2.6		17.0	-	9.6
Evaporation		1.3	3.8	5.1	4.5	4.0	5.0	5.4	5.2	6.0	6.0	46.3	-	67.0
Growing Degrees	5	17.3	17.8	19.5	21.0	21.7	20.9	22.1	22.1	22.7	22.7	207.8	-	200.2
	10	12.3	12.8	14.5	16.0	16.7	15.9	17.1	17.1	17.7	17.7	157.8	-	150.2

2nd 10-day period (11-20/08/2009)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	37.6	-	43.3
Precipitation - Reference Evapotranspiration	-20.6	-	-33.7
Number of Rainy Days	3.0	-	1.4
Number of Dry Days	1.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

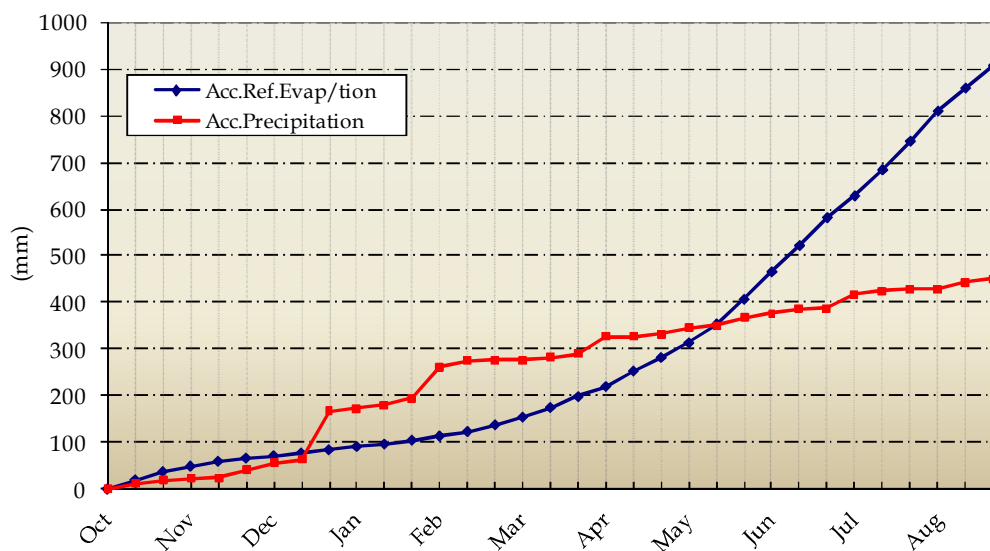


Trikala Imathias

2nd 10-day period (11-20/08/2009)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	26.6	28.6	32.0	32.0	33.0	33.2	33.8	34.0	35.0	35.0	32.3	-	31.7
	Min	19.6	17.4	17.6	18.0	19.6	20.0	20.0	20.0	20.2	20.0	19.2	-	17.9
Relative Humidity	Max	99	99	93	93	96	99	90	94	95	94	95	-	-
	Min	61	55	36	36	37	34	34	26	26	34	38	-	-
Soil Temperature at 10 cm	06 UTC	25.2	24.0	23.4	24.8	25.4	26.0	27.0	27.0	27.4	28.0	25.8	-	25.7
	12 UTC	27.4	25.2	28.8	29.0	28.4	30.0	31.0	31.2	32.0	31.8	29.5	-	27.2
Sunshine Duration		1.5	4.1	11.5	8.9	8.5	10.5	10.2	11.1	10.1	10.8	8.7	-	9.5
Precipitation		2.5	2.4		1.0							5.9	-	3.7
Evaporation		2.6	2.3	3.1	3.3	4.4	4.4	3.9	3.5	5.5	6.4	39.4	-	56.6
Growing Degrees	5	18.1	18.0	19.8	20.0	21.3	21.6	21.9	22.0	22.6	22.5	207.8	-	197.6
	10	13.1	13.0	14.8	15.0	16.3	16.6	16.9	17.0	17.6	17.5	157.8	-	147.6

2nd 10-day period (11-20/08/2009)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	48.5	-	44.1
Precipitation - Reference Evapotranspiration	-42.6	-	-40.4
Number of Rainy Days	3.0	-	1.0
Number of Dry Days	1.0	-	-

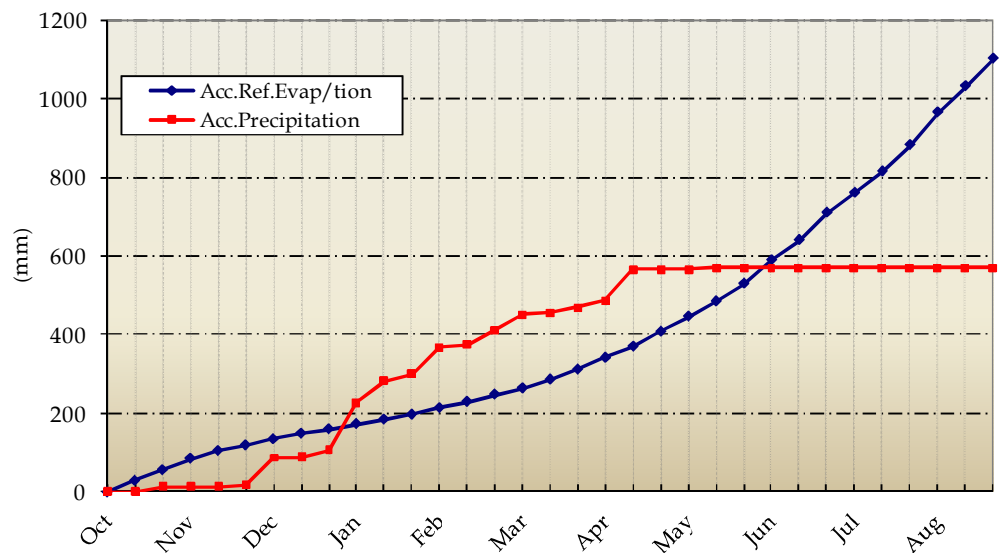
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



2nd 10-day period (11-20/08/2009)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	33.0	32.8	29.8	30.8	33.6	30.0	30.8	33.8	34.0	35.0	32.4	-	31.8
	Min	23.6	20.0	21.0	18.8	19.2	21.6	22.8	21.0	20.0	19.0	20.7	-	20.7
Relative Humidity	Max	42	48	49	69	57	58	59	64	49	53	55	-	-
	Min	17	29	28	28	25	33	42	22	23	23	27	-	-
Soil Temperature at 10 cm	06 UTC	29.8	29.6	29.4	28.2	28.4	29.4	29.2	28.4	28.2	28.0	28.9	-	30.5
	12 UTC	35.0	35.4	33.6	34.2	34.4	33.0	32.6	33.4	33.4	33.8	33.9	-	34.5
Sunshine Duration		11.2	10.7	11.1	10.8	11.0	11.5	11.3	11.6	11.6	11.6	11.2	-	11.4
Precipitation													-	0.0
Evaporation		14.9	12.5	12.7	10.2	11.5	13.9	12.2	12.0	12.7	16.8	129.4	-	112.9
Growing Degrees	5	23.3	21.4	20.4	19.8	21.4	20.8	21.8	22.4	22.0	22.0	215.3	-	211.9
	10	18.3	16.4	15.4	14.8	16.4	15.8	16.8	17.4	17.0	17.0	165.3	-	162.0

2nd 10-day period (11-20/08/2009)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	70.0	-	61.8
Precipitation - Reference Evapotranspiration	-70.0	-	-61.8
Number of Rainy Days	0.0	-	0.0
Number of Dry Days	108.0	-	-

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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