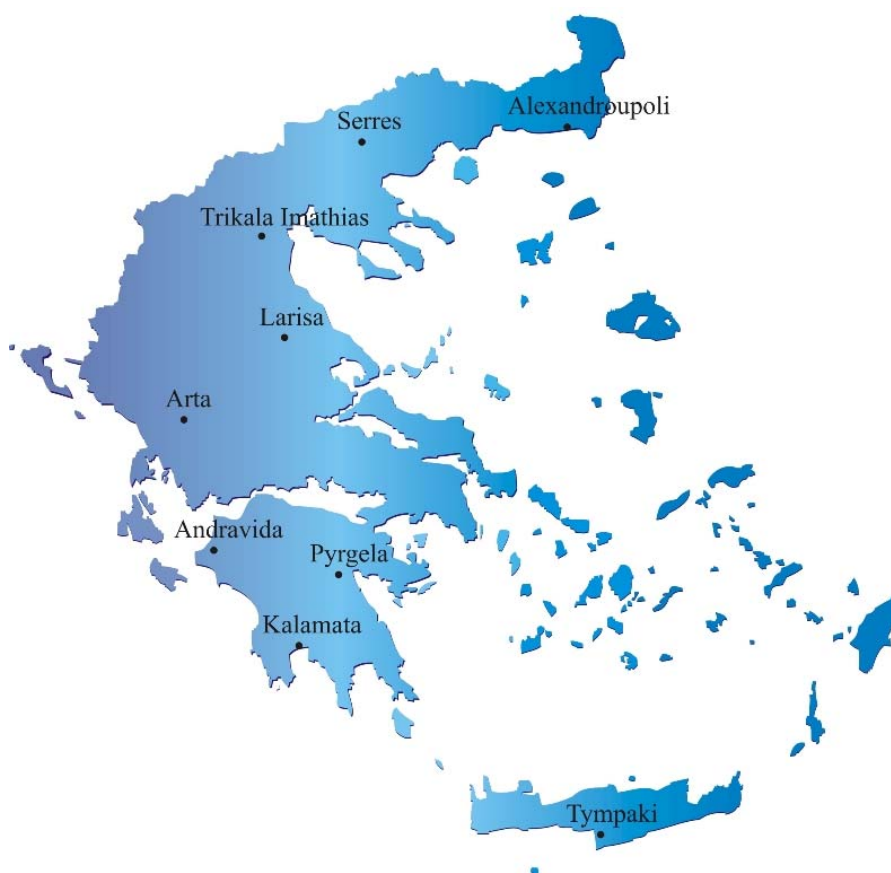


AGROMETEOROLOGICAL BULLETIN

*August 2010
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



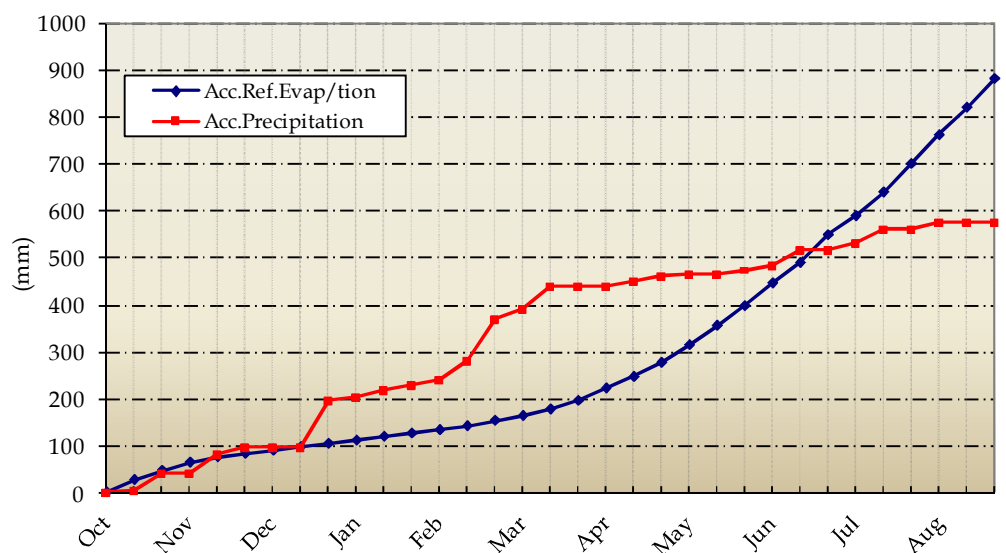
Hellenic National Meteorological Service
Division of Climatology-Applications
El. Venizelou Street 14, 16777
Helliniko, Athens

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

2nd 10-day period (11-20/08/2010)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	38.6	35.4	37.4	38.4	35.4	35.8	36.6	35.8	36.0	35.4	36.5	32.3	30.5
	Min	25.6	22.6	26.2	22.4	22.0	22.6	21.4	25.6	22.4	23.6	23.4	19.0	17.7
Relative Humidity	Max	65	70	78	79	82	77	79	74	76	62	74	75	-
	Min	28	42	28	28	36	32	31	29	29	30	31	29	-
Soil Temperature at 10 cm	06 UTC	30.4	30.0	30.6	29.8	30.6	30.4	30.0	30.0	29.8	30.2	30.2	26.6	23.8
	12 UTC	32.0	32.2	32.6	32.6	32.6	32.4	32.0	32.0	31.8	31.8	32.2	29.8	27.9
Sunshine Duration		11.6	12.0	12.7	11.8	11.7	11.8	11.9	12.4	12.4	12.3	12.1	11.7	10.0
Precipitation														3.9
Evaporation		10.6	12.2	7.8	9.8	11.6	9.1	10.2	-	11.8	10.0	-	107.0	94.5
Growing Degrees	5	27.1	24.0	26.8	25.4	23.7	24.2	24.0	25.7	24.2	24.5	249.6	206.2	191.3
	10	22.1	19.0	21.8	20.4	18.7	19.2	19.0	20.7	19.2	19.5	199.6	156.2	141.3

2nd 10-day period (11-20/08/2010)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	61.5	56.7	55.4
Precipitation - Reference Evapotranspiration	-61.5	-56.7	-51.5
Number of Rainy Days	0.0	0.0	1.0
Number of Dry Days	23.0	41.0	-

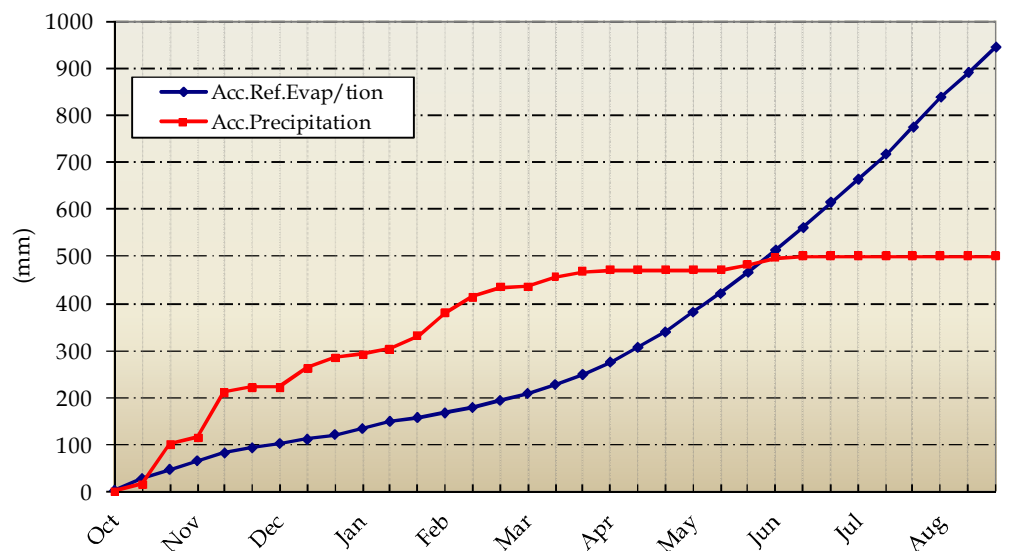
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



2nd 10-day period (11-20/08/2010)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	33.6	32.6	32.2	33.4	34.6	35.2	32.2	31.6	32.0	33.8	33.1	32.3	31.2
	Min	21.4	22.0	20.8	20.4	21.2	21.8	20.6	19.6	18.2	18.6	20.5	20.3	18.7
Relative Humidity	Max	91	92	98	89	86	89	89	88	90	91	90	89	-
	Min	42	40	39	40	38	29	39	31	40	36	37	35	-
Soil Temperature at 10 cm	06 UTC	29.2	30.0	29.6	29.2	29.4	29.4	29.2	28.2	27.8	27.8	29.0	28.6	27.4
	12 UTC	-	37.8	36.0	37.2	32.0	32.2	36.6	35.6	35.8	36.2	35.5	35.2	31.7
Sunshine Duration		11.2	11.5	11.2	11.6	11.6	11.0	12.2	11.9	11.6	11.4	11.5	11.3	11.2
Precipitation														4.0
Evaporation		-	7.0	10.6	5.6	9.6	6.4	9.3	4.8	14.3	4.4	-	96.6	73.5
Growing Degrees	5	22.5	22.3	21.5	21.9	22.9	23.5	21.4	20.6	20.1	21.2	217.9	212.8	199.2
	10	17.5	17.3	16.5	16.9	17.9	18.5	16.4	15.6	15.1	16.2	167.9	162.8	149.2

2nd 10-day period (11-20/08/2010)	Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	54.1	52.5
Precipitation - Reference Evapotranspiration	-54.1	-52.5
Number of Rainy Days	0.0	0.0
Number of Dry Days	58.0	57.0

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

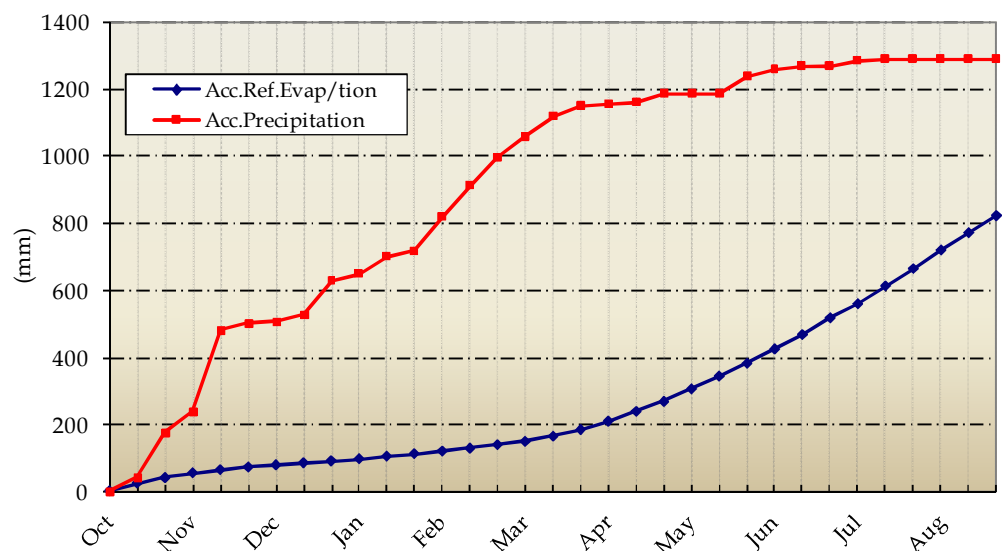




2nd 10-day period (11-20/08/2010)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	36.8	36.4	36.2	37.6	38.0	37.6	35.6	32.4	34.6	37.2	36.2	33.7	32.0
	Min	20.0	19.6	21.0	20.0	20.0	20.2	20.4	15.6	17.0	18.0	19.2	19.5	18.0
Relative Humidity	Max	87	95	95	95	97	94	86	79	87	81	90	92	-
	Min	33	26	32	35	33	23	37	32	41	31	32	32	-
Soil Temperature at 10 cm	06 UTC	29.0	29.2	29.4	29.2	29.2	29.2	29.4	28.2	28.2	28.4	28.9	28.3	26.6
	12 UTC	31.0	31.0	31.0	31.0	31.0	31.0	31.0	30.2	30.4	30.8	30.8	30.5	31.0
Sunshine Duration		12.2	11.5	12.3	12.3	12.3	11.4	12.3	12.4	12.3	12.2	12.1	11.0	10.1
Precipitation													5.3	3.2
Evaporation		7.6	7.0	7.5	6.9	7.0	5.7	9.5	6.3	5.4	6.0	68.9	64.6	-
Growing Degrees	5	23.4	23.0	23.6	23.8	24.0	23.9	23.0	19.0	20.8	22.6	227.1	216.1	199.3
	10	18.4	18.0	18.6	18.8	19.0	18.9	18.0	14.0	15.8	17.6	177.1	166.1	149.5

2nd 10-day period (11-20/08/2010)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	51.0	49.5	45.1
Precipitation - Reference Evapotranspiration	-51.0	-44.2	-41.9
Number of Rainy Days	0.0	2.0	0.7
Number of Dry Days	29.0	37.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

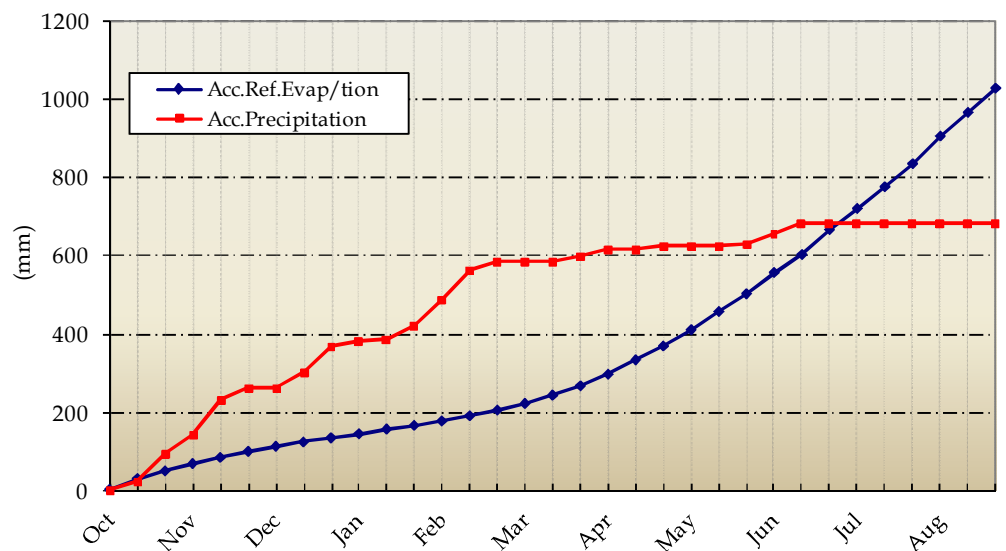


Kalamata

2nd 10-day period (11-20/08/2010)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	31.8	31.8	32.6	35.0	38.0	37.8	37.8	34.2	34.8	34.2	34.8	31.0	31.4
	Min	19.4	19.4	20.4	19.2	21.4	22.6	20.6	23.6	19.8	20.0	20.6	20.2	18.2
Relative Humidity	Max	92	92	89	88	71	76	77	72	70	81	81	88	-
	Min	45	46	40	33	24	28	22	27	29	36	33	44	-
Soil Temperature at 10 cm	06 UTC	26.4	26.4	26.4	26.6	26.4	26.8	27.0	26.6	26.4	26.4	26.5	25.2	25.7
	12 UTC	29.0	29.0	29.4	29.0	29.0	29.4	29.4	28.4	29.0	29.0	29.1	27.1	29.6
Sunshine Duration		11.9	11.7	12.7	12.0	12.0	11.6	11.8	12.3	12.2	12.0	12.0	10.9	10.6
Precipitation													19.7	3.9
Evaporation		8.0	4.8	7.6	11.8	9.2	2.3	11.7	8.6	3.9	8.1	76.0	75.7	78.6
Growing Degrees	5	20.6	20.6	21.5	22.1	24.7	25.2	24.2	23.9	22.3	22.1	227.2	206.3	198.2
	10	15.6	15.6	16.5	17.1	19.7	20.2	19.2	18.9	17.3	17.1	177.2	156.3	148.2

2nd 10-day period (11-20/08/2010)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	61.7	48.7	50.7
Precipitation - Reference Evapotranspiration	-61.7	-29.0	-46.8
Number of Rainy Days	0.0	1.0	0.7
Number of Dry Days	58.0	3.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

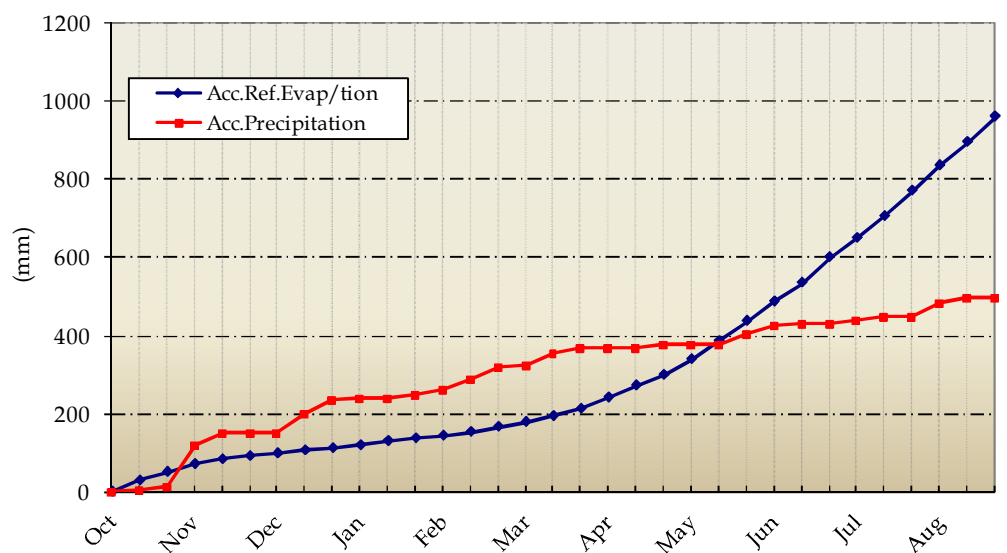


Larisa

2nd 10-day period (11-20/08/2010)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	35.6	36.8	36.6	38.4	38.2	38.0	39.2	36.4	36.4	36.2	37.2	32.1	32.3
	Min	22.0	20.0	19.4	20.4	22.0	22.2	21.8	21.8	20.4	23.2	21.3	19.2	17.5
Relative Humidity	Max	68	67	72	73	65	62	67	68	80	70	69	80	-
	Min	26	22	30	21	23	27	22	22	30	30	25	33	-
Soil Temperature at 10 cm	06 UTC	28.0	27.6	27.4	27.8	28.4	26.8	28.6	28.4	28.4	28.8	28.0	27.2	26.4
	12 UTC	30.8	30.0	30.8	30.4	31.4	31.6	31.8	31.4	31.4	32.2	31.2	29.4	28.7
Sunshine Duration		12.2	12.1	12.0	12.2	11.8	11.1	12.1	12.0	12.0	11.8	11.9	10.3	9.9
Precipitation													1.7	6.2
Evaporation		8.9	7.6	7.8	18.2	11.5	11.3	12.8	13.0	10.8	11.4	113.3	86.3	84.1
Growing Degrees	5	23.8	23.4	23.0	24.4	25.1	25.1	25.5	24.1	23.4	24.7	242.5	206.4	199.1
	10	18.8	18.4	18.0	19.4	20.1	20.1	20.5	19.1	18.4	19.7	192.5	156.4	149.1

2nd 10-day period (11-20/08/2010)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	65.3	54.4	53.3
Precipitation - Reference Evapotranspiration	-65.3	-52.7	-47.1
Number of Rainy Days	0.0	2.0	1.4
Number of Dry Days	14.0	3.0	-

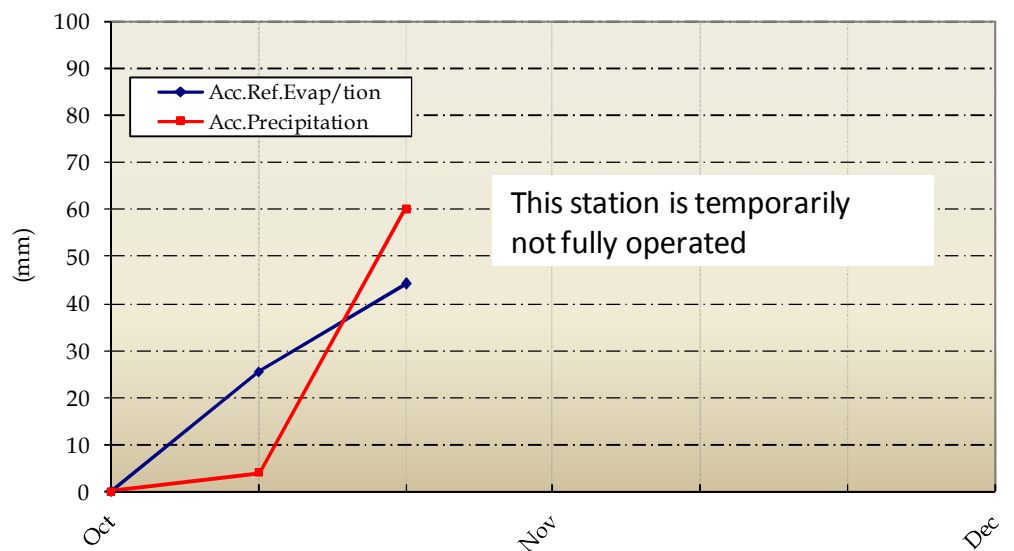
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



2nd 10-day period (11-20/08/2010)		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	33.6
	Min	21.0	19.2	19.0	-	-	20.2	20.6	16.8	19.8	-	19.5	18.9	17.0
Relative Humidity	Max	61	61	-	-	62	46	61	42	-	-	56	61	-
	Min	22	19	-	-	18	20	26	18	-	-	20	29	-
Soil Temperature at 10 cm	06 UTC	31.0	30.6	31.0	-	-	32.0	32.0	30.0	30.0	-	30.9	27.5	26.0
	12 UTC	-	39.0	-	-	-	39.0	40.0	39.2	39.4	-	39.3	34.9	33.8
Sunshine Duration		11.1	11.0	-	-	-	11.2	11.1	11.3	-	-	11.1	10.5	10.0
Precipitation												-		7.5
Evaporation		7.8	8.4	-	-	-	8.8	6.8	7.6	-	-	-	79.8	64.9
Growing Degrees	5	-	-	-	-	-	-	-	-	-	-	-	213.7	202.8
	10	-	-	-	-	-	-	-	-	-	-	-	163.7	152.8

2nd 10-day period (11-20/08/2010)		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

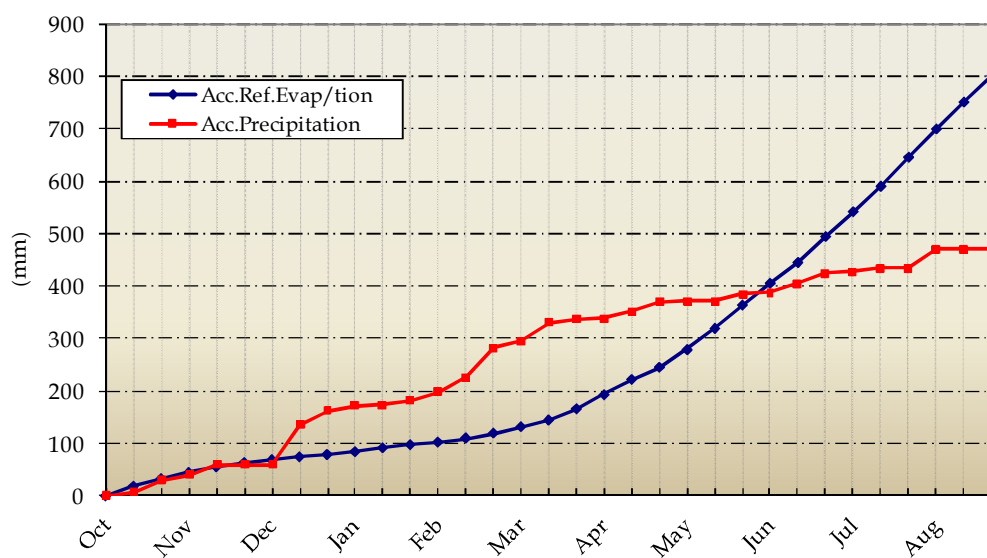


Series

2nd 10-day period (11-20/08/2010)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	38.4	38.8	39.0	40.6	39.8	39.6	37.6	37.2	37.2	37.2	38.5	32.5	32.0
	Min	22.2	21.6	22.2	22.0	22.0	22.4	22.2	20.6	21.0	21.6	21.8	19.1	18.0
Relative Humidity	Max	67	61	62	63	62	52	53	62	66	57	60	81	-
	Min	22	24	22	23	23	18	24	23	27	26	23	39	-
Soil Temperature at 10 cm	06 UTC	28.0	28.2	28.4	28.8	29.4	30.0	29.4	29.4	29.6	30.0	29.1	24.8	25.4
	12 UTC	29.6	29.6	29.8	30.8	31.0	31.6	31.4	30.0	30.6	30.8	30.5	27.3	28.7
Sunshine Duration		11.8	11.4	11.5	12.1	12.0	10.9	11.7	10.1	11.3	11.5	11.4	6.8	9.8
Precipitation													17.0	9.6
Evaporation		10.0	9.0	9.0	9.0	10.2	7.8	7.1	6.3	7.1	6.5	82.0	46.3	67.0
Growing Degrees	5	25.3	25.2	25.6	26.3	25.9	26.0	24.9	23.9	24.1	24.4	251.6	207.8	200.2
	10	20.3	20.2	20.6	21.3	20.9	21.0	19.9	18.9	19.1	19.4	201.6	157.8	150.2

2nd 10-day period (11-20/08/2010)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	49.9	37.6	43.3
Precipitation - Reference Evapotranspiration	-49.9	-20.6	-33.7
Number of Rainy Days	0.0	3.0	1.4
Number of Dry Days	25.0	1.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

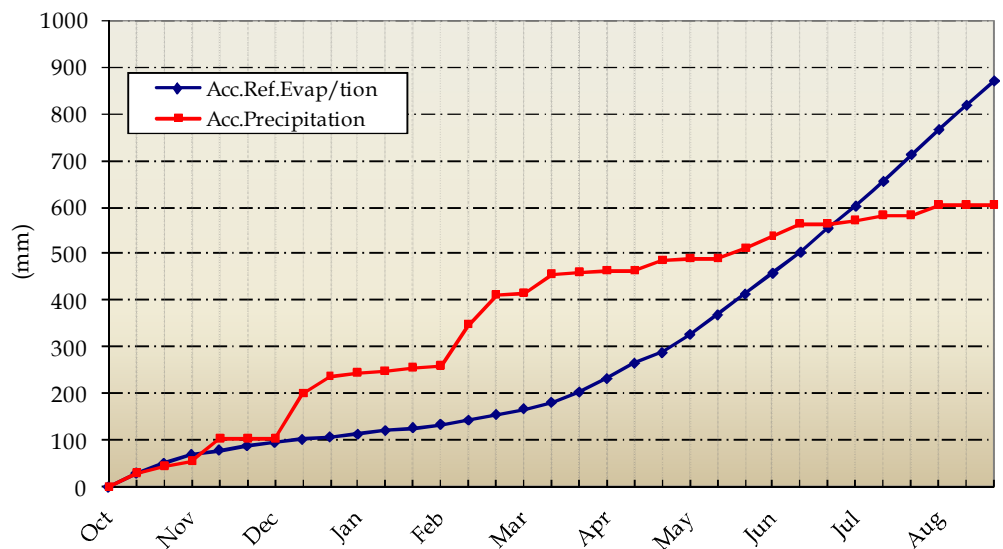


Trikala Imathias

2nd 10-day period (11-20/08/2010)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	37.6	37.6	37.2	40.0	38.6	37.0	37.4	35.6	34.2	36.6	37.2	32.3	31.7
	Min	21.2	21.6	21.0	20.4	21.0	21.0	22.0	20.4	21.0	21.8	21.1	19.2	17.9
Relative Humidity	Max	94	95	98	-	98	92	92	98	97	71	93	95	-
	Min	35	37	37	-	35	38	27	33	44	27	35	38	-
Soil Temperature at 10 cm	06 UTC	27.8	28.0	27.8	28.0	-	28.6	28.4	28.0	28.0	28.0	28.1	25.8	25.7
	12 UTC	31.0	31.0	31.0	31.2	-	31.4	31.0	30.8	30.8	30.0	30.9	29.5	27.2
Sunshine Duration		10.7	11.3	11.4	-	11.1	10.7	11.1	11.7	11.3	11.5	11.2	8.7	9.5
Precipitation													5.9	3.7
Evaporation		4.4	5.2	4.4	-	4.2	5.4	4.4	4.8	4.2	3.2	-	39.4	56.6
Growing Degrees	5	24.4	24.6	24.1	25.2	24.8	24.0	24.7	23.0	22.6	24.2	241.6	207.8	197.6
	10	19.4	19.6	19.1	20.2	19.8	19.0	19.7	18.0	17.6	19.2	191.6	157.8	147.6

2nd 10-day period (11-20/08/2010)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	52.3	48.5	44.1
Precipitation - Reference Evapotranspiration	-52.3	-42.6	-40.4
Number of Rainy Days	0.0	3.0	1.0
Number of Dry Days	15.0	1.0	-

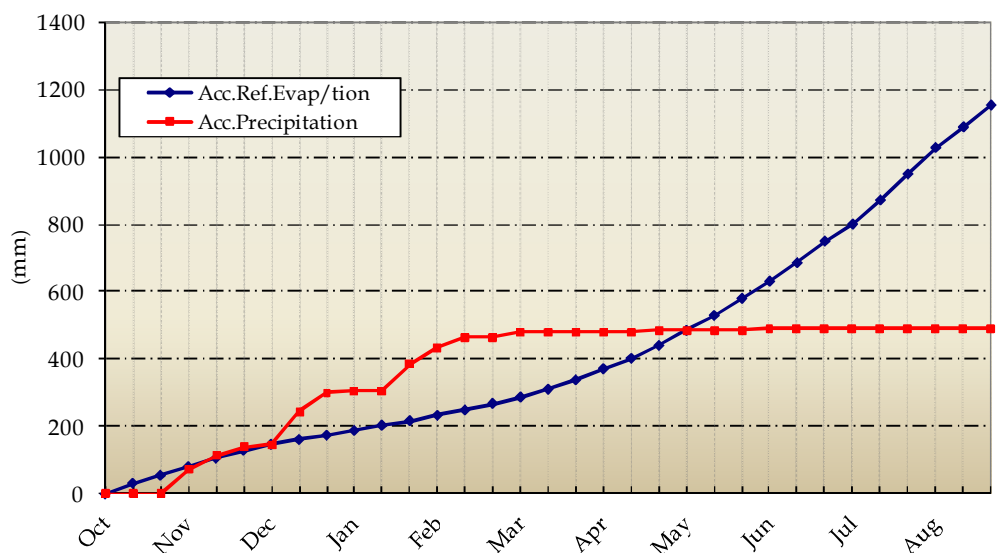
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



2nd 10-day period (11-20/08/2010)		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	31.0	30.6	33.0	36.0	37.2	34.4	34.6	38.4	37.6	34.5	32.4	31.8
	Min	23.8	22.2	21.6	21.8	22.4	23.4	23.4	24.6	26.4	29.8	23.9	20.7	20.7
Relative Humidity	Max	92	95	96	95	52	54	99	86	51	55	78	55	-
	Min	38	34	34	24	23	16	32	27	22	26	28	27	-
Soil Temperature at 10 cm	06 UTC	31.6	31.6	32.0	31.2	31.8	31.2	31.4	32.2	32.8	32.2	31.8	28.9	30.5
	12 UTC	36.8	36.8	36.8	37.6	36.0	37.0	37.2	37.4	38.2	37.0	37.1	33.9	34.5
Sunshine Duration		11.2	10.4	10.0	10.8	11.2	11.6	10.3	9.4	11.1	11.4	10.7	11.2	11.4
Precipitation														0.0
Evaporation		9.4	5.7	8.7	8.7	17.7	18.0	9.7	10.2	13.5	13.6	115.2	129.4	112.9
Growing Degrees	5	22.9	21.6	21.1	22.4	24.2	25.3	23.9	24.6	27.4	28.7	242.1	215.3	211.9
	10	17.9	16.6	16.1	17.4	19.2	20.3	18.9	19.6	22.4	23.7	192.1	165.3	162.0

2nd 10-day period (11-20/08/2010)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	64.6	70.0	61.8
Precipitation - Reference Evapotranspiration	-64.6	-70.0	-61.8
Number of Rainy Days	0.0	0.0	0.0
Number of Dry Days	76.0	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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ΜΕΤΕΩΡΟΛΟΓΙΚΗ
ΥΠΗΡΕΣΙΑ

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