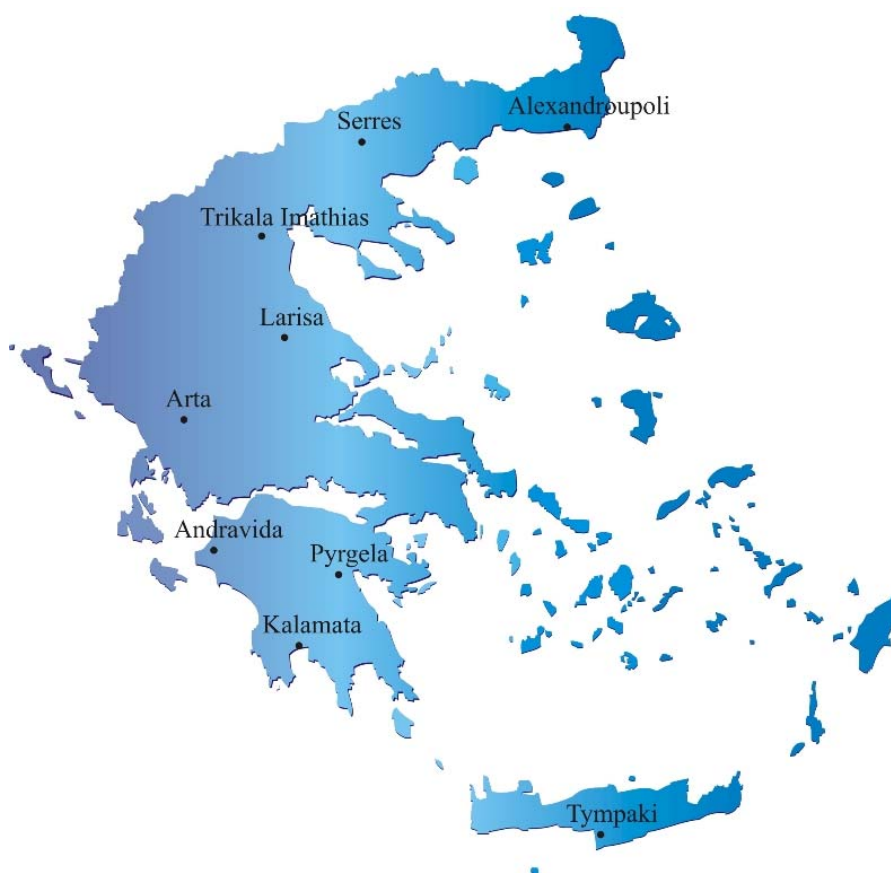




AGROMETEOROLOGICAL BULLETIN

August 2009
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



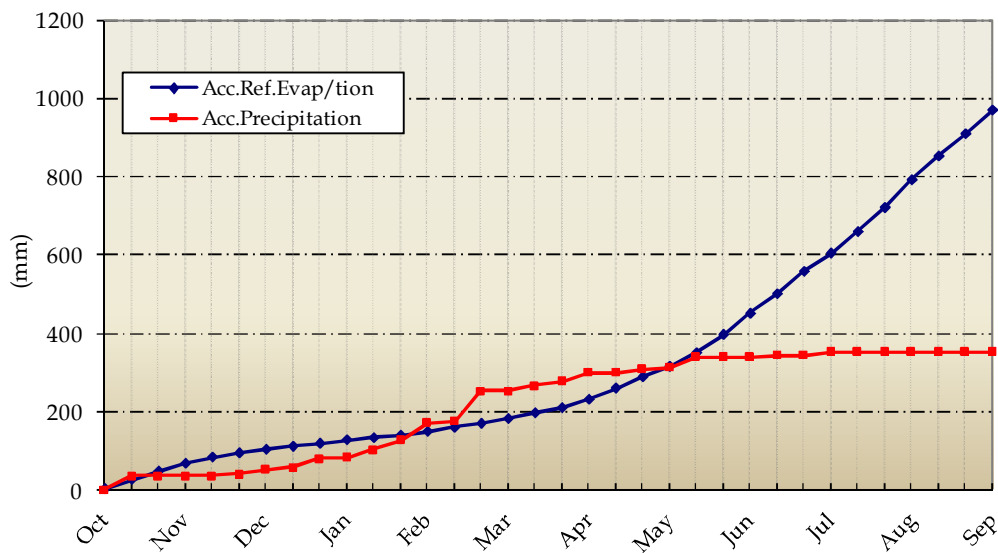
Hellenic National Meteorological Service
Division of Climatology-Applications
El. Venizelou Street 14, 16777
Helliniko, Athens

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

3rd 10-day period (21-31/08/2009)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	32.0	32.0	32.2	30.0	28.8	31.6	32.0	32.2	31.2	31.6	32.0	31.4	-	29.1
	Min	22.0	19.6	19.4	20.2	18.8	16.6	19.6	18.8	19.8	18.0	20.4	19.4	-	16.6
Relative Humidity	Max	61	66	60	76	76	75	79	73	80	80	81	73	-	-
	Min	24	29	26	38	42	35	24	20	38	39	37	32	-	-
Soil Temperature at 10 cm	06 UTC	27.4	26.2	26.4	25.6	26.0	25.0	26.6	25.8	26.2	26.2	26.6	26.2	-	23.0
	12 UTC	-	30.2	30.2	30.0	29.8	30.4	29.4	29.4	29.2	30.0	29.4	29.8	-	27.1
Sunshine Duration		12.4	12.6	12.4	10.4	6.3	12.4	12.5	12.4	12.0	11.8	8.7	11.3	-	9.8
Precipitation														-	4.5
Evaporation		8.7	11.5	9.7	7.8	7.0	10.0	9.6	8.4	8.8	11.5	9.7	102.7	-	93.1
Growing Degrees	5	22.0	20.8	20.8	20.1	18.8	19.1	20.8	20.5	20.5	19.8	21.2	224.4	-	196.4
	10	17.0	15.8	15.8	15.1	13.8	14.1	15.8	15.5	15.5	14.8	16.2	169.4	-	141.4

3rd 10-day period (21-31/08/2009)	Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	60.5	54.2
Precipitation - Reference Evapotranspiration	-60.5	-49.7
Number of Rainy Days	0.0	1.0
Number of Dry Days	52.0	-

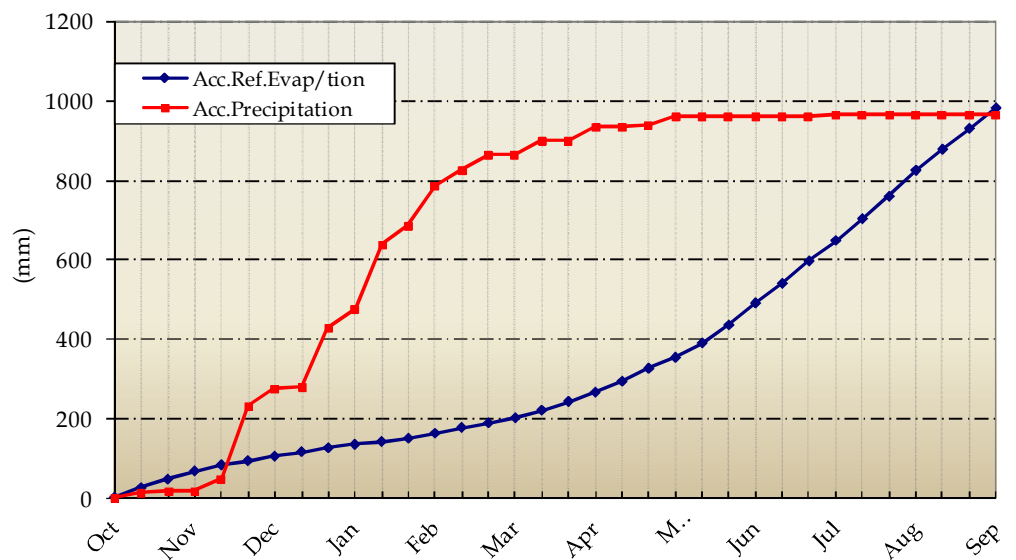
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



3rd 10-day period (21-31/08/2009)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	36.4	32.0	32.8	32.2	30.0	31.2	31.0	32.2	31.4	30.2	31.6	31.9	-	30.0
	Min	17.6	18.8	18.2	18.8	18.4	19.4	16.4	17.6	20.2	21.4	18.6	18.7	-	18.5
Relative Humidity	Max	76	83	82	80	87	94	87	92	95	96	89	87	-	-
	Min	22	34	24	29	51	28	32	32	47	54	39	36	-	-
Soil Temperature at 10 cm	06 UTC	27.2	28.2	27.6	27.0	27.4	27.4	26.6	26.8	28.0	28.4	28.0	27.5	-	26.8
	12 UTC	36.0	35.2	34.0	34.0	33.8	34.4	32.8	34.4	34.8	34.4	34.4	34.4	-	30.8
Sunshine Duration		11.7	10.9	11.6	11.4	8.5	11.2	11.7	11.3	10.1	10.4	11.1	10.9	-	10.6
Precipitation														-	3.8
Evaporation		12.6	7.7	3.3	9.5	1.0	9.2	10.6	4.8	6.6	2.8	8.0	76.1	-	74.7
Growing Degrees	5	22.0	20.4	20.5	20.5	19.2	20.3	18.7	19.9	20.8	20.8	20.1	223.2	-	211.8
	10	17.0	15.4	15.5	15.5	14.2	15.3	13.7	14.9	15.8	15.8	15.1	168.2	-	156.8

3rd 10-day period (21-31/08/2009)	Previous Year Value	Past Years Mean Value	
Reference Evapotranspiration	52.2	-	49.7
Precipitation - Reference Evapotranspiration	-52.2	-	-45.9
Number of Rainy Days	0.0	-	0.7
Number of Dry Days	68.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

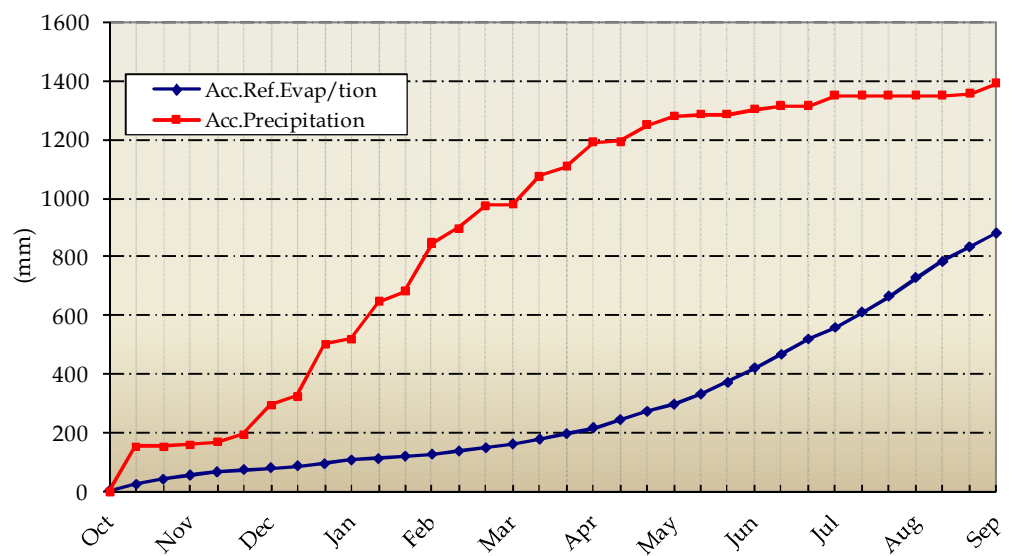


Arta

3rd 10-day period (21-31/08/2009)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	35.4	33.6	33.0	33.4	30.0	32.4	33.2	34.0	32.2	32.0	31.2	32.8	-	30.8
	Min	21.4	18.2	18.0	17.0	17.6	17.8	17.6	17.0	19.2	17.0	18.0	18.1	-	17.2
Relative Humidity	Max	70	90	98	93	92	94	88	89	92	85	92	89	-	-
	Min	24	34	20	34	48	20	17	17	27	28	34	28	-	-
Soil Temperature at 10 cm	06 UTC	28.4	29.0	28.8	28.6	26.8	26.4	27.0	26.6	27.0	26.6	26.4	27.4	-	25.3
	12 UTC	30.6	30.6	30.6	30.0	28.6	29.0	29.4	-	29.2	29.0	27.8	29.5	-	29.6
Sunshine Duration		12.0	12.0	11.6	7.2	10.7	11.7	11.4	11.5	8.6	8.1	9.0	10.3	-	9.8
Precipitation					5.1		11.5			1.2	18.4		36.2	-	10.1
Evaporation		10.1	5.9	8.0	2.9	3.4	5.0	6.0	6.1	4.2	5.1	4.8	61.5	-	-
Growing Degrees	5	23.4	20.9	20.5	20.2	18.8	20.1	20.4	20.5	20.7	19.5	19.6	224.6	-	208.9
	10	18.4	15.9	15.5	15.2	13.8	15.1	15.4	15.5	15.7	14.5	14.6	169.6	-	153.9

3rd 10-day period (21-31/08/2009)	Previous Year Value	Past Years Mean Value	
Reference Evapotranspiration	47.8	-	44.8
Precipitation - Reference Evapotranspiration	-11.6	-	-34.7
Number of Rainy Days	4.0	-	1.2
Number of Dry Days	8.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

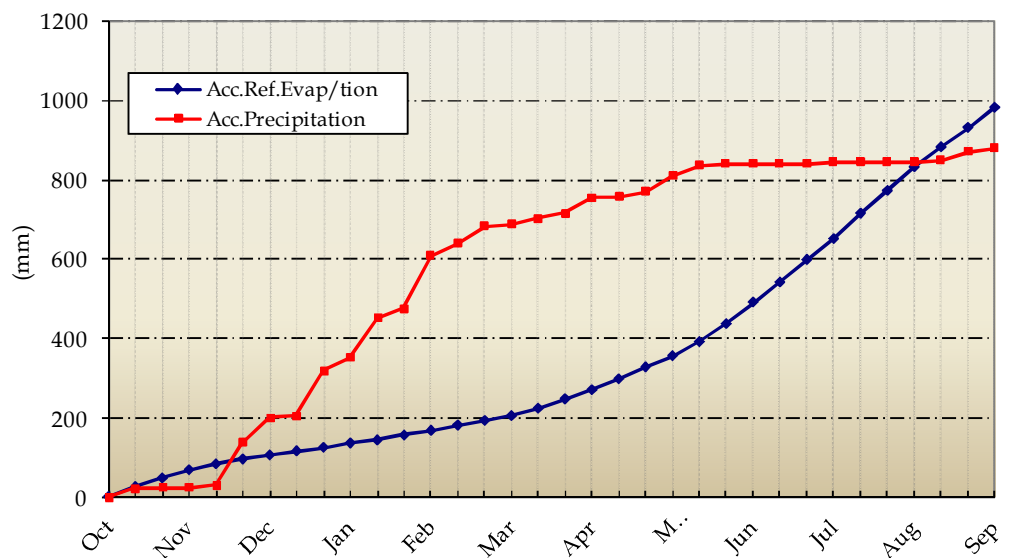


Kalamata

3rd 10-day period (21-31/08/2009)		21	22	23	24	25	26	27	28	29	30	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	33.6	29.8	32.4	33.0	28.8	30.2	30.8	29.8	30.2	30.4	31.2	30.9	-	30.5
	Min	20.0	18.2	19.6	18.6	20.2	18.8	18.6	15.6	17.0	20.6	19.0	18.7	-	17.7
Relative Humidity	Max	87	90	78	82	96	96	84	89	90	89	92	88	-	-
	Min	26	55	28	26	60	50	29	41	43	60	40	42	-	-
Soil Temperature at 10 cm	06 UTC	25.0	25.4	25.0	24.8	25.4	25.0	24.6	24.0	23.4	25.2	25.0	24.8	-	25.4
	12 UTC	27.2	26.2	27.0	26.4	27.0	26.0	26.0	25.6	26.4	26.2	26.4	26.4	-	29.0
Sunshine Duration		12.1	10.6	11.9	10.8	9.6	10.8	12.2	12.1	12.2	6.1	10.8	10.8	-	10.0
Precipitation						10.8							10.8	-	3.6
Evaporation		10.0	5.0	4.0	6.0	5.8	7.0	7.0	8.0	5.0	2.0	8.0	67.8	-	81.7
Growing Degrees	5	21.8	19.0	21.0	20.8	19.5	19.5	19.7	17.7	18.6	20.5	20.1	218.2	-	210.0
	10	16.8	14.0	16.0	15.8	14.5	14.5	14.7	12.7	13.6	15.5	15.1	163.2	-	155.0

3rd 10-day period (21-31/08/2009)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	50.8	-	52.5
Precipitation - Reference Evapotranspiration	-40.0	-	-48.9
Number of Rainy Days	1.0	-	0.9
Number of Dry Days	12.0	-	-

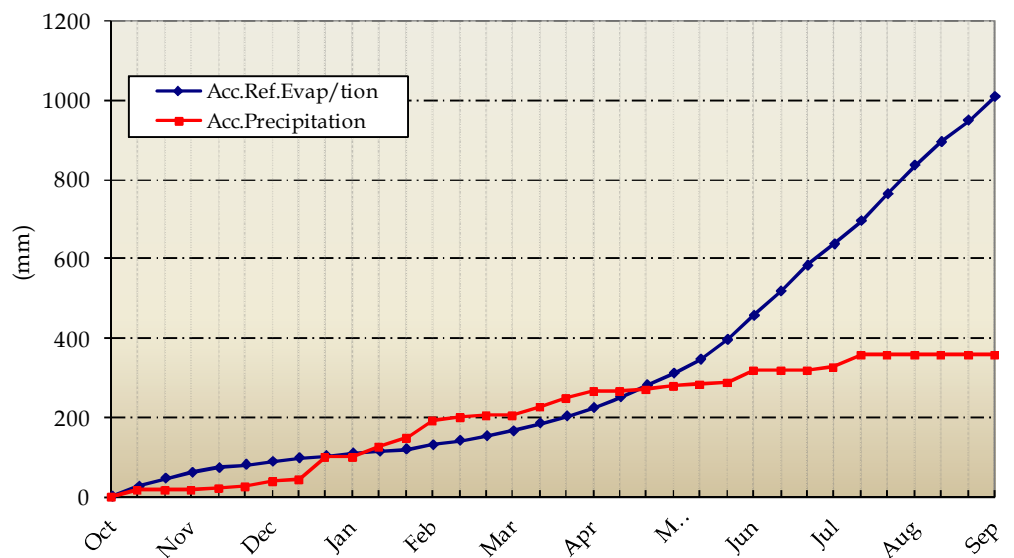
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



3rd 10-day period (21-31/08/2009)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	31.0	32.0	32.8	29.8	29.4	31.6	32.4	33.4	34.8	34.4	32.2	32.2	-	31.3
	Min	21.4	18.4	19.0	20.4	18.4	16.0	16.6	17.0	16.0	18.6	20.4	18.4	-	16.4
Relative Humidity	Max	70	77	72	75	84	78	66	78	79	100	70	77	-	-
	Min	38	36	21	36	36	29	31	30	16	27	34	30	-	-
Soil Temperature at 10 cm	06 UTC	27.6	27.2	27.4	27.2	27.0	27.2	25.2	26.6	26.4	27.0	27.6	26.9	-	25.5
	12 UTC	30.0	30.2	29.8	29.6	28.4	28.6	30.0	29.2	29.2	29.6	29.4	29.5	-	27.7
Sunshine Duration		9.7	10.7	11.3	6.5	9.8	11.2	11.8	11.5	10.7	10.1	5.1	9.9	-	9.7
Precipitation						0.1							0.1	-	8.3
Evaporation		10.5	7.7	11.1	8.6	6.9	7.9	11.2	7.6	12.3	6.7	7.9	98.4	-	85.2
Growing Degrees	5	21.2	20.2	20.9	20.1	18.9	18.8	19.5	20.2	20.4	21.5	21.3	223.0	-	207.5
	10	16.2	15.2	15.9	15.1	13.9	13.8	14.5	15.2	15.4	16.5	16.3	168.0	-	152.5

3rd 10-day period (21-31/08/2009)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	59.3	-	54.4
Precipitation - Reference Evapotranspiration	-59.2	-	-46.1
Number of Rainy Days	1.0	-	1.6
Number of Dry Days	12.0	-	-

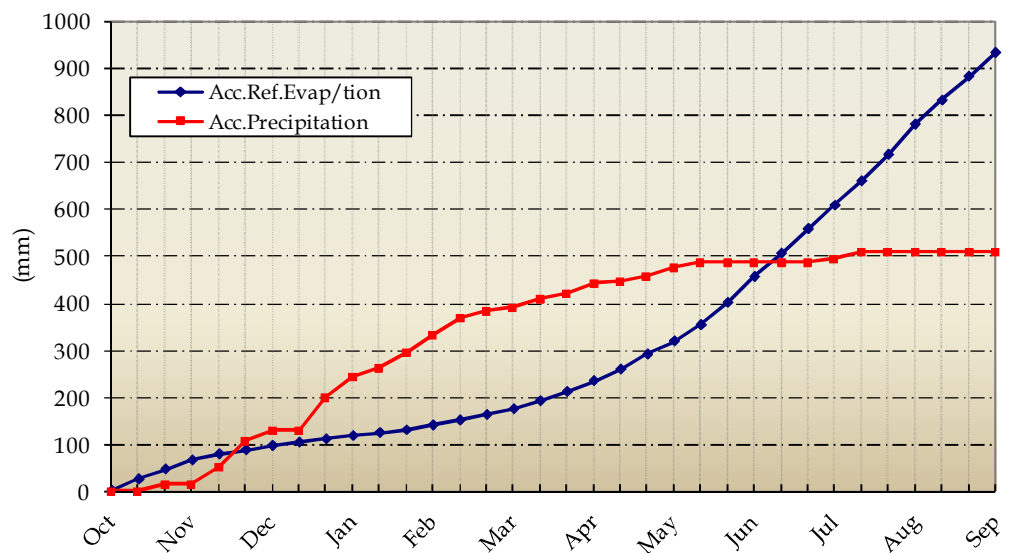
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



3rd 10-day period (21-31/08/2009)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	34.4	33.4	32.4	32.4	33.2	31.8	33.0	34.8	32.0	33.6	35.0	33.3	-	32.6
	Min	21.0	17.8	15.6	19.6	16.6	16.4	14.4	14.4	15.6	15.0	17.6	16.7	-	15.9
Relative Humidity	Max	44	49	51	49	73	58	63	74	80	78	91	65	-	-
	Min	32	29	31	29	32	32	29	23	31	42	34	31	-	-
Soil Temperature at 10 cm	06 UTC	28.4	27.4	26.2	26.4	26.0	25.8	25.4	25.2	25.6	25.4	26.2	26.2	-	24.7
	12 UTC	35.0	34.4	33.8	32.4	34.4	32.8	33.0	33.6	33.8	34.4	34.4	33.8	-	32.6
Sunshine Duration		11.5	11.6	11.2	11.4	8.2	11.4	11.3	11.2	11.1	8.2	7.4	10.4	-	9.6
Precipitation												0.3	0.3	-	6.4
Evaporation		11.2	8.2	9.0	7.7	5.6	7.9	7.2	7.8	7.2	4.1	6.0	81.9	-	63.2
Growing Degrees	5	22.7	20.6	19.0	21.0	19.9	19.1	18.7	19.6	18.8	19.3	21.3	220.0	-	211.1
	10	17.7	15.6	14.0	16.0	14.9	14.1	13.7	14.6	13.8	14.3	16.3	165.0	-	156.4

3rd 10-day period (21-31/08/2009)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	50.6	-	47.4
Precipitation - Reference Evapotranspiration	-50.3	-	-41.0
Number of Rainy Days	1.0	-	1.0
Number of Dry Days	55.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

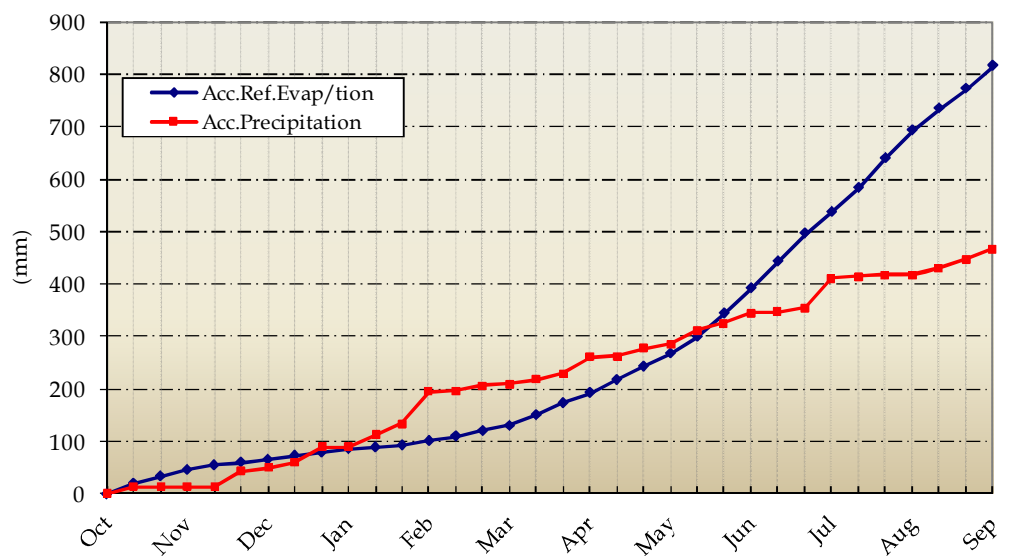


Series

3rd 10-day period (21-31/08/2009)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	33.0	33.2	34.2	31.4	30.8	32.4	33.0	33.4	34.0	31.4	33.4	32.7	-	30.6
	Min	23.2	20.2	19.0	19.4	18.2	18.0	17.6	17.6	18.4	18.6	19.2	19.0	-	16.8
Relative Humidity	Max	70	70	73	74	92	77	77	66	70	71	87	75	-	-
	Min	39	34	30	38	41	31	30	32	30	49	33	35	-	-
Soil Temperature at 10 cm	06 UTC	26.4	26.4	26.2	26.6	24.8	24.2	24.2	24.4	24.8	23.8	25.0	25.2	-	24.4
	12 UTC	29.0	29.0	28.6	28.2	26.4	28.0	28.2	28.8	29.0	27.2	29.2	28.3	-	27.5
Sunshine Duration		8.8	11.2	10.1	6.2	8.9	11.8	10.9	11.7	11.6	8.7	7.4	9.8	-	9.1
Precipitation					0.0	19.7						0.6	20.3	-	10.2
Evaporation		6.0	6.0	5.4	1.4	4.0	3.0	5.0	4.0	5.0	0.4	4.2	44.4	-	65.5
Growing Degrees	5	23.1	21.7	21.6	20.4	19.5	20.2	20.3	20.5	21.2	20.0	21.3	229.8	-	205.9
	10	18.1	16.7	16.6	15.4	14.5	15.2	15.3	15.5	16.2	15.0	16.3	174.8	-	150.9

3rd 10-day period (21-31/08/2009)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	43.7	-	43.4
Precipitation - Reference Evapotranspiration	-23.4	-	-33.2
Number of Rainy Days	2.0	-	2.1
Number of Dry Days	5.0	-	-

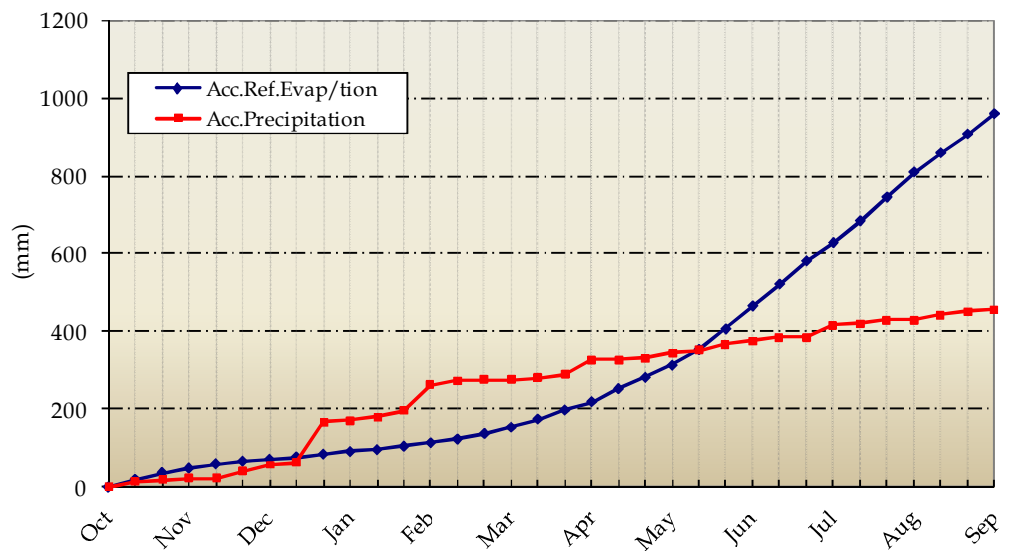
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



3rd 10-day period (21-31/08/2009)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	31.4	31.2	33.6	30.2	29.6	31.0	32.4	32.4	32.6	33.0	31.4	31.7	-	30.0
	Min	22.0	19.6	19.8	19.4	18.0	16.4	17.2	18.0	18.0	19.2	19.0	18.8	-	16.3
Relative Humidity	Max	96	97	96	99	95	99	95	93	95	89	91	95	-	-
	Min	52	45	36	48	46	42	35	40	42	43	38	42	-	-
Soil Temperature at 10 cm	06 UTC	28.2	27.4	27.6	28.0	26.8	24.8	25.2	26.0	26.4	26.8	27.0	26.7	-	24.6
	12 UTC	32.0	31.0	31.4	30.8	28.2	28.8	30.0	30.0	29.8	29.6	29.8	30.1	-	26.0
Sunshine Duration		10.2	10.4	10.9	5.3	7.0	9.6	10.9	10.9	10.0	7.1	8.5	9.2	-	9.1
Precipitation						6.2							6.2	-	9.5
Evaporation		4.1	3.5	4.2	3.2	2.8	3.4	3.4	3.2	3.0	5.2	6.2	42.2	-	55.8
Growing Degrees	5	21.7	20.4	21.7	19.8	18.8	18.7	19.8	20.2	20.3	21.1	20.2	222.7	-	199.7
	10	16.7	15.4	16.7	14.8	13.8	13.7	14.8	15.2	15.3	16.1	15.2	167.7	-	144.7

3rd 10-day period (21-31/08/2009)	Previous Year Value	Past Years Mean Value	
Reference Evapotranspiration	51.7	-	44.2
Precipitation - Reference Evapotranspiration	-45.5	-	-34.7
Number of Rainy Days	1.0	-	1.4
Number of Dry Days	10.0	-	-

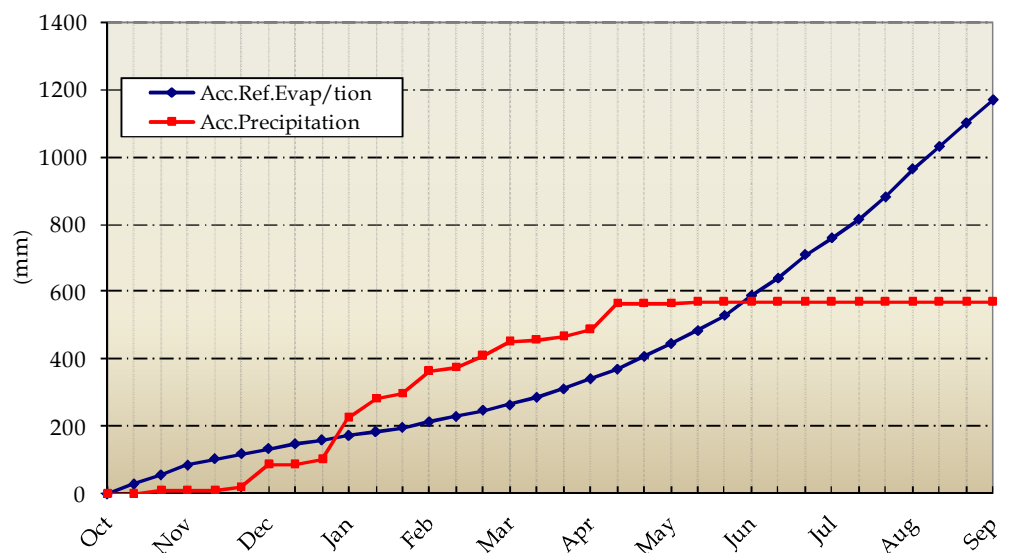
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



3rd 10-day period (21-31/08/2009)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	34.8	31.8	32.8	31.8	32.0	29.4	30.6	30.8	30.0	29.0	35.0	31.6	-	30.8
	Min	21.4	20.6	17.4	19.2	19.4	19.2	17.8	17.0	18.0	18.4	21.0	19.0	-	19.9
Relative Humidity	Max	61	57	50	69	73	67	61	70	77	94	52	66	-	-
	Min	32	29	21	25	31	33	31	29	26	33	17	28	-	-
Soil Temperature at 10 cm	06 UTC	29.4	28.8	27.6	27.6	27.6	28.0	27.0	27.0	27.0	27.2	27.2	27.7	-	29.7
	12 UTC	33.4	33.0	32.6	33.2	32.8	32.4	31.8	33.0	33.0	33.2	34.0	32.9	-	33.5
Sunshine Duration		11.1	12.0	11.6	11.4	11.6	11.6	11.4	11.3	10.7	10.2	10.7	11.2	-	11.2
Precipitation														-	
Evaporation		14.6	13.9	13.5	11.8	12.2	12.6	13.3	9.5	7.7	10.3	14.1	133.5	-	108.9
Growing Degrees	5	23.1	21.2	20.1	20.5	20.7	19.3	19.2	18.9	19.0	18.7	23.0	223.7	-	224.3
	10	18.1	16.2	15.1	15.5	15.7	14.3	14.2	13.9	14.0	13.7	18.0	168.7	-	169.3

3rd 10-day period (21-31/08/2009)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	68.4	-	61.2
Precipitation - Reference Evapotranspiration	-68.4	-	-61.2
Number of Rainy Days	0.0	-	0.0
Number of Dry Days	119.0	-	-

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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