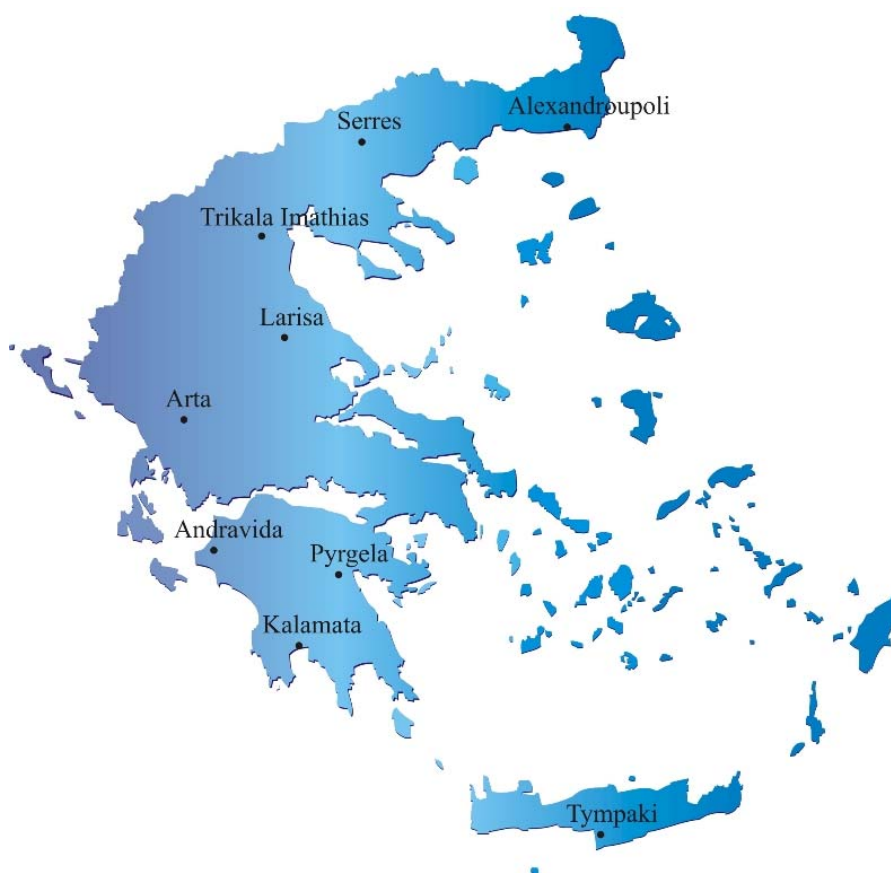




# AGROMETEOROLOGICAL BULLETIN

*September 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



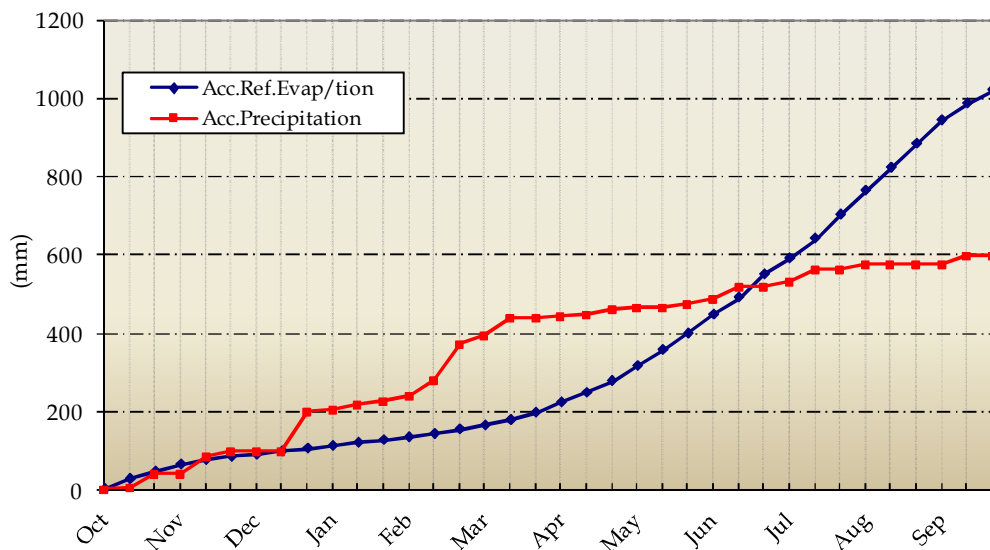
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*Web addresses of HNMS*  
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[www.meteohellas.gr](http://www.meteohellas.gr)

2nd 10-day period (11-20/09/2010)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	26.0	24.4	26.4	26.8	29.2	29.4	27.8	26.6	30.6	29.8	27.7	25.2	26.5
	Min	19.4	18.0	18.2	13.0	14.2	13.2	13.0	16.2	14.6	15.2	15.5	17.5	13.8
Relative Humidity	Max	70	81	75	74	88	83	89	83	80	81	80	88	-
	Min	52	52	30	38	39	28	42	60	41	39	42	48	-
Soil Temperature at 10 cm	06 UTC	24.2	23.8	22.8	22.4	22.6	22.6	22.4	23.0	23.0	23.4	23.0	20.7	19.9
	12 UTC	25.6	25.4	25.2	25.0	25.0	25.4	25.2	25.5	25.6	25.4	25.3	22.9	23.7
Sunshine Duration		4.2	1.0	8.7	8.6	10.9	11.0	10.4	10.5	9.5	8.5	8.3	5.1	8.5
Precipitation													20.2	5.2
Evaporation		7.8	3.0	6.8	6.9	5.1	7.3	5.9	4.8	5.6	6.9	60.1	42.3	66.6
Growing Degrees	5	17.7	16.2	17.3	14.9	16.7	16.3	15.4	16.4	17.6	17.5	166.0	163.6	151.3
	10	12.7	11.2	12.3	9.9	11.7	11.3	10.4	11.4	12.6	12.5	116.0	113.6	101.3

2nd 10-day period (11-20/09/2010)	Previous Year Value	Past Years Mean Value	
Reference Evapotranspiration	34.5	29.3	37.1
Precipitation - Reference Evapotranspiration	-34.5	-9.1	-31.9
Number of Rainy Days	0.0	1.0	0.9
Number of Dry Days	19.0	3.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

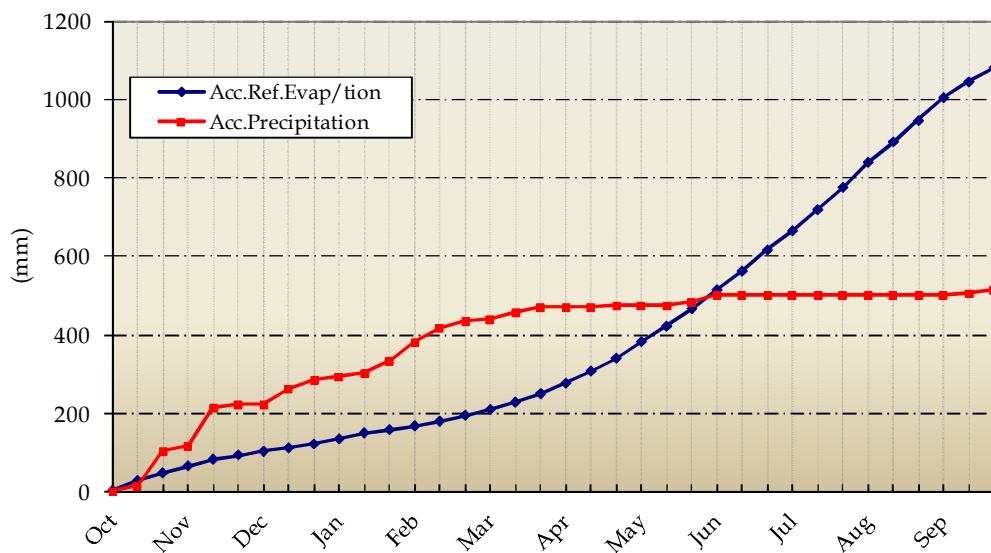


Andravida

2nd 10-day period (11-20/09/2010)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	27.6	26.4	27.6	28.0	28.0	27.4	27.4	27.6	27.4	28.2	27.6	28.1	28.2
	Min	18.6	16.8	16.4	17.0	17.8	17.6	17.4	16.8	16.4	18.6	17.3	18.4	16.5
Relative Humidity	Max	94	96	98	96	92	91	94	92	96	98	95	94	-
	Min	50	49	48	45	33	46	47	49	55	58	48	50	-
Soil Temperature at 10 cm	06 UTC	25.2	22.0	21.8	22.2	23.2	23.0	23.0	23.0	23.0	23.8	23.0	24.4	23.4
	12 UTC	29.4	28.2	29.4	30.2	30.4	30.4	31.0	31.0	31.0	30.4	30.1	29.2	26.9
Sunshine Duration		9.8	9.8	10.2	9.9	10.1	10.0	9.7	10.2	9.1	9.3	9.8	6.6	9.1
Precipitation		7.5	0.2									7.7	12.0	7.0
Evaporation		0.3	1.0	6.6	9.0	2.8	1.7	12.2	3.2	4.8	4.8	46.4	46.7	56.3
Growing Degrees	5	18.1	16.6	17.0	17.5	17.9	17.5	17.4	17.2	16.9	18.4	174.5	182.4	173.6
	10	13.1	11.6	12.0	12.5	12.9	12.5	12.4	12.2	11.9	13.4	124.5	132.4	123.6

2nd 10-day period (11-20/09/2010)	Previous Year Value	Past Years Mean Value	
Reference Evapotranspiration	36.0	31.7	36.2
Precipitation - Reference Evapotranspiration	-28.3	-19.7	-29.2
Number of Rainy Days	2.0	4.0	1.1
Number of Dry Days	4.0	81.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

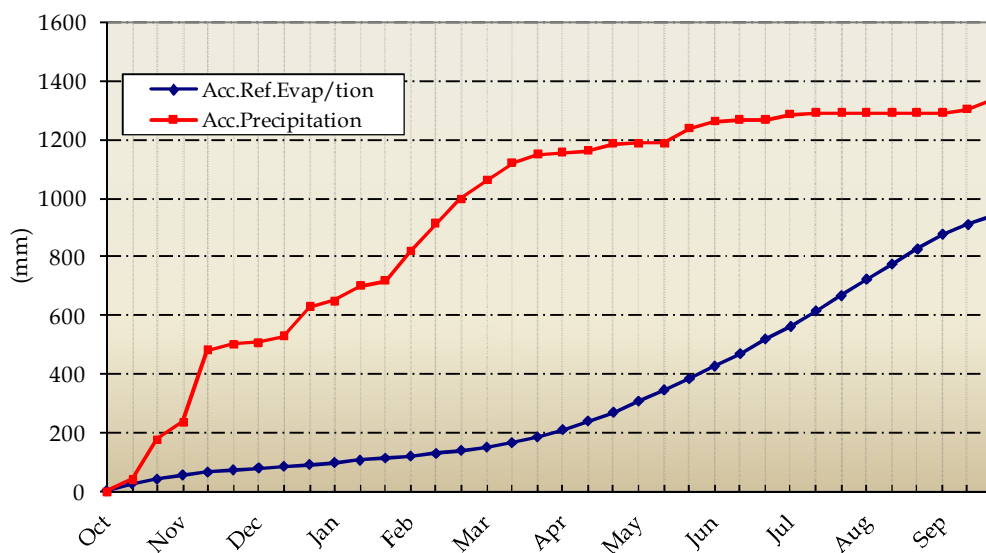


Arta

2nd 10-day period (11-20/09/2010)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	22.6	28.0	28.2	30.0	30.0	29.0	28.6	29.2	28.8	30.6	28.5	29.6	28.9
	Min	17.6	14.6	14.6	16.4	16.0	15.0	16.0	15.4	15.8	17.4	15.9	16.9	15.1
Relative Humidity	Max	96	98	94	94	95	90	78	86	95	95	92	93	-
	Min	79	34	35	40	23	51	49	48	49	40	45	39	-
Soil Temperature at 10 cm	06 UTC	25.0	22.2	22.8	25.2	23.6	23.2	23.4	23.0	23.2	24.0	23.6	24.2	21.3
	12 UTC	23.8	24.0	24.4	24.6	25.2	25.0	25.2	25.0	25.2	25.6	24.8	25.7	25.4
Sunshine Duration		0.3	9.8	9.4	7.7	10.0	7.8	10.2	10.3	10.2	9.8	8.6	7.6	8.6
Precipitation		22.6	15.0									37.6	14.2	11.9
Evaporation		3.0	5.5	4.6	4.8	4.8	4.2	6.3	3.4	5.3	4.6	46.5	39.6	-
Growing Degrees	5	15.1	16.3	16.4	18.2	18.0	17.0	17.3	17.3	17.3	19.0	171.9	182.7	169.9
	10	10.1	11.3	11.4	13.2	13.0	12.0	12.3	12.3	12.3	14.0	121.9	132.7	119.9

2nd 10-day period (11-20/09/2010)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	30.5	29.2	32.0
Precipitation - Reference Evapotranspiration	7.1	-15.0	-20.1
Number of Rainy Days	2.0	3.0	1.5
Number of Dry Days	5.0	6.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

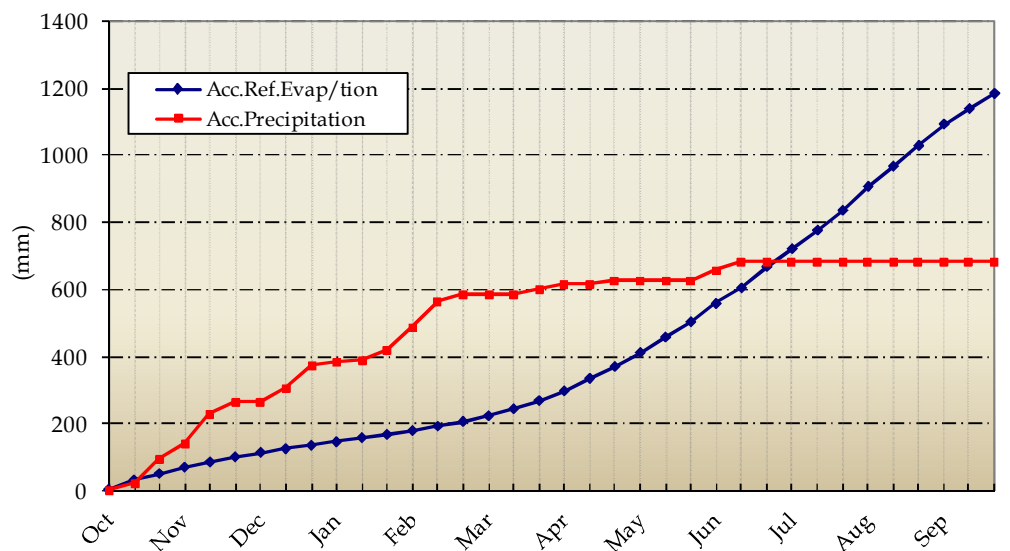


Kalamata

2nd 10-day period (11-20/09/2010)		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	27.8	28.6	27.0	28.2	30.0	31.0	30.2	30.6	30.8	29.1	27.7	28.6
	Min	18.2	15.4	16.0	16.6	16.4	16.4	17.8	16.2	16.8	18.8	16.9	18.1	15.9
Relative Humidity	Max	94	96	89	92	96	92	92	91	92	86	92	97	-
	Min	52	42	43	56	41	31	33	40	36	34	41	56	-
Soil Temperature at 10 cm	06 UTC	24.6	23.4	23.2	23.0	23.4	23.6	23.8	23.6	23.8	24.0	23.6	22.9	22.6
	12 UTC	25.4	25.6	25.6	25.0	25.6	25.6	25.6	25.4	25.6	25.8	25.5	24.3	25.8
Sunshine Duration		6.1	9.7	11.3	8.5	11.0	10.4	10.4	11.1	10.8	10.0	9.9	7.3	8.7
Precipitation		0.0			0.1							0.1	83.0	6.3
Evaporation		4.2	6.4	6.4	5.2	1.2	7.0	8.2	2.6	11.7	7.0	59.9	75.7	60.4
Growing Degrees	5	17.4	16.6	17.3	16.8	17.3	18.2	19.4	18.2	18.7	19.8	179.7	179.0	172.4
	10	12.4	11.6	12.3	11.8	12.3	13.2	14.4	13.2	13.7	14.8	129.7	129.0	122.4

2nd 10-day period (11-20/09/2010)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	45.1	31.6	38.1
Precipitation - Reference Evapotranspiration	-45.0	51.4	-31.8
Number of Rainy Days	1.0	4.0	1.0
Number of Dry Days	82.0	5.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



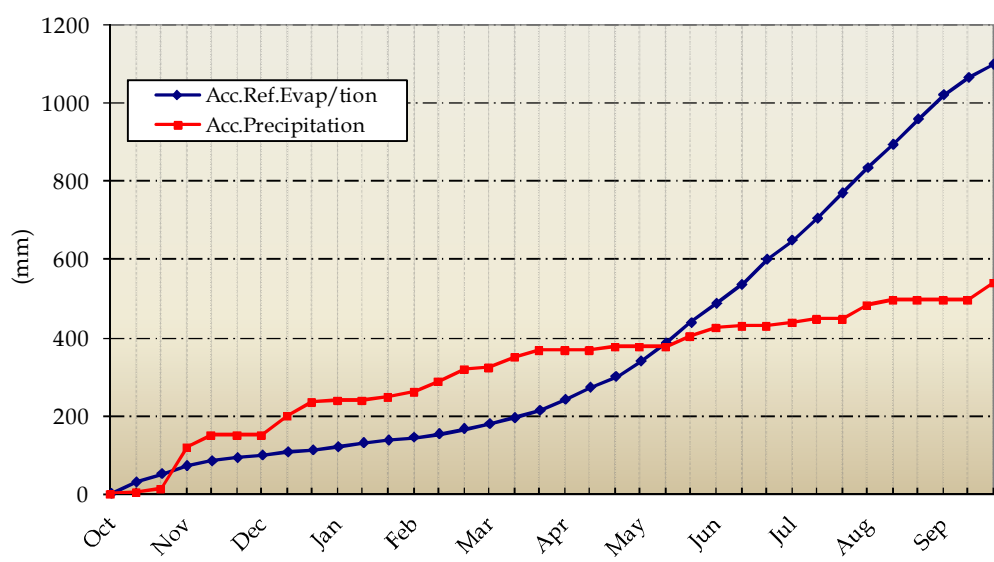


Larisa

2nd 10-day period (11-20/09/2010)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	24.0	24.6	26.4	27.2	28.6	30.2	32.2	34.4	33.4	31.4	29.2	26.3	29.0
	Min	16.4	16.0	15.4	16.0	14.0	14.0	14.6	14.6	15.0	18.2	15.4	17.4	14.0
Relative Humidity	Max	96	96	98	93	91	95	89	88	94	90	93	93	-
	Min	58	57	41	42	35	31	24	23	26	39	38	49	-
Soil Temperature at 10 cm	06 UTC	25.6	23.0	19.4	22.2	22.4	21.0	22.2	22.2	22.8	23.4	22.4	22.8	22.0
	12 UTC	26.6	26.8	26.2	23.8	24.4	24.6	24.6	25.2	25.6	26.2	25.4	24.6	24.1
Sunshine Duration		1.1	0.9	8.7	6.3	8.8	9.6	9.4	9.9	9.0	8.9	7.3	3.9	8.3
Precipitation		9.9	14.0	18.8								42.7	17.4	12.0
Evaporation		2.5	9.1	0.2	2.6	5.1	5.0	5.0	7.5	2.2	6.9	46.1	39.6	61.4
Growing Degrees	5	15.2	15.3	15.9	16.6	16.3	17.1	18.4	19.5	19.2	19.8	173.3	168.6	165.0
	10	10.2	10.3	10.9	11.6	11.3	12.1	13.4	14.5	14.2	14.8	123.3	118.6	115.0

2nd 10-day period (11-20/09/2010)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	34.1	28.8	38.0
Precipitation - Reference Evapotranspiration	8.6	-11.4	-26.0
Number of Rainy Days	3.0	7.0	1.2
Number of Dry Days	5.0	3.0	-

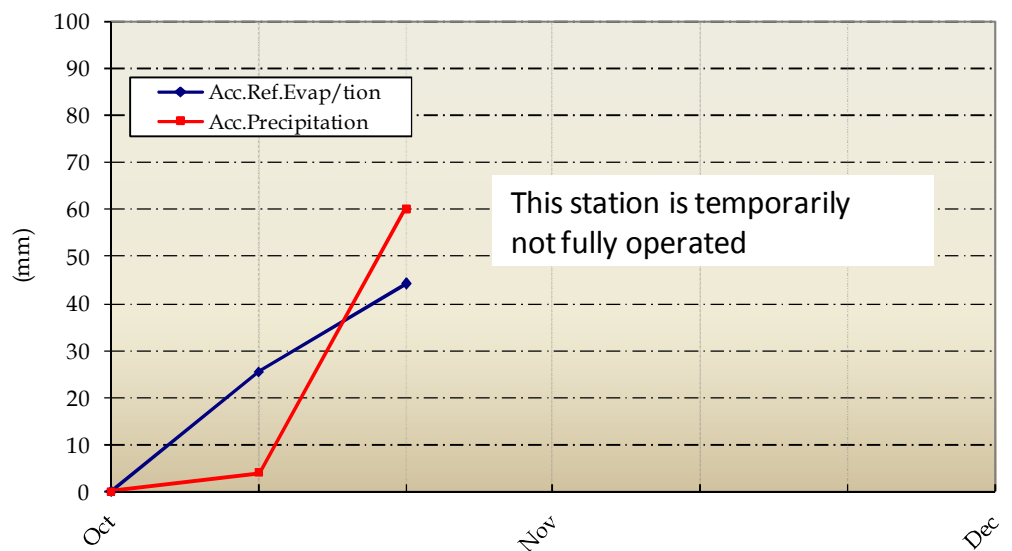
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



2nd 10-day period (11-20/09/2010)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	-	-	-	-	-	-	-	-	-	-	-	27.7	30.2
	Min	18.6	-	-	18.0	13.8	13.0	14.0	14.8	14.0	15.0	15.2	17.8	14.1
Relative Humidity	Max	-	-	70	74	64	60	81	77	90	77	74	90	-
	Min	-	-	35	30	25	20	26	24	26	32	27	51	-
Soil Temperature at 10 cm	06 UTC	23.6	-	-	22.4	21.0	21.0	22.0	21.4	21.4	22.2	21.9	21.9	21.7
	12 UTC	26.2	-	26.6	27.4	27.0	28.2	28.4	-	29.4	27.0	27.5	26.6	29.0
Sunshine Duration		-	-	7.9	9.1	9.7	9.6	10.1	9.8	9.8	6.2	9.0	5.0	8.5
Precipitation		-	-	-	-	-	-	-	-	-	-	-	42.7	3.5
Evaporation		-	-	3.4	2.0	3.0	3.4	4.6	4.0	3.0	3.2	-	31.1	45.1
Growing Degrees	5	-	-	-	-	-	-	-	-	-	-	-	177.6	171.4
	10	-	-	-	-	-	-	-	-	-	-	-	127.6	121.4

2nd 10-day period (11-20/09/2010)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	-	25.8	32.8
Precipitation - Reference Evapotranspiration	-	16.9	-29.3
Number of Rainy Days	-	8.0	1.0
Number of Dry Days	-	1.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

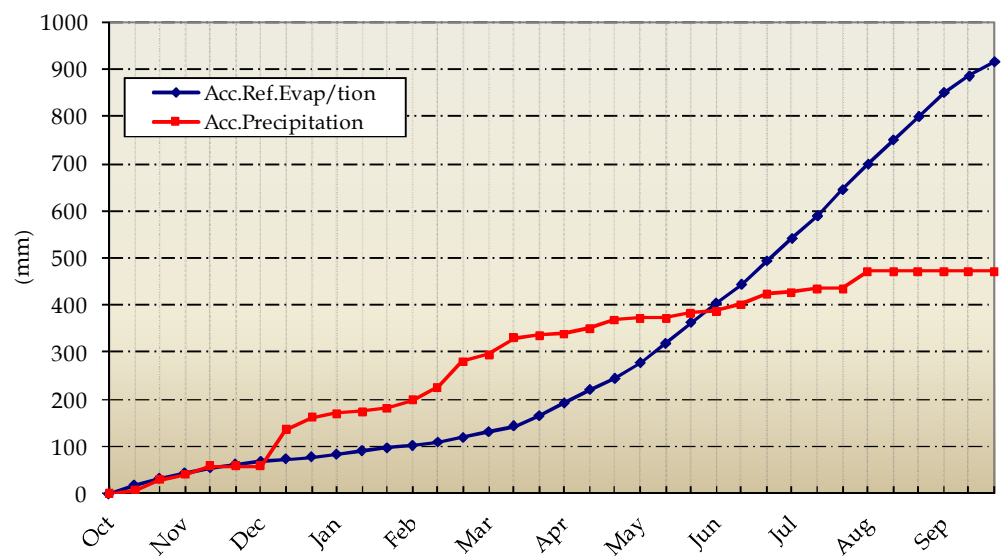


Series

2nd 10-day period (11-20/09/2010)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	27.2	25.0	29.8	30.2	31.8	32.2	34.0	35.0	34.2	31.8	31.1	25.6	28.4
	Min	17.0	18.4	13.8	14.0	14.2	14.0	15.0	15.0	15.2	18.0	15.5	16.1	14.3
Relative Humidity	Max	79	79	81	79	73	55	69	81	81	71	75	90	-
	Min	42	45	28	21	23	20	23	23	27	24	28	53	-
Soil Temperature at 10 cm	06 UTC	26.4	25.8	24.6	24.8	24.4	24.4	24.4	24.8	25.2	25.6	25.0	21.0	20.6
	12 UTC	27.2	25.8	26.0	26.2	25.8	26.0	26.4	26.6	26.6	26.4	26.3	22.9	24.0
Sunshine Duration		3.2	0.0	9.2	9.5	10.0	9.3	10.1	9.2	9.9	9.2	8.0	2.9	8.1
Precipitation		0.2										0.2	19.5	7.9
Evaporation		4.2	2.6	2.9	9.6	4.8	3.0	5.0	5.5	5.6	5.4	48.6	19.1	47.8
Growing Degrees	5	17.1	16.7	16.8	17.1	18.0	18.1	19.5	20.0	19.7	19.9	182.9	158.5	162.6
	10	12.1	11.7	11.8	12.1	13.0	13.1	14.5	15.0	14.7	14.9	132.9	108.5	112.8

2nd 10-day period (11-20/09/2010)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	30.5	19.6	29.3
Precipitation - Reference Evapotranspiration	-30.3	-0.1	-21.4
Number of Rainy Days	1.0	5.0	1.4
Number of Dry Days	3.0	1.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



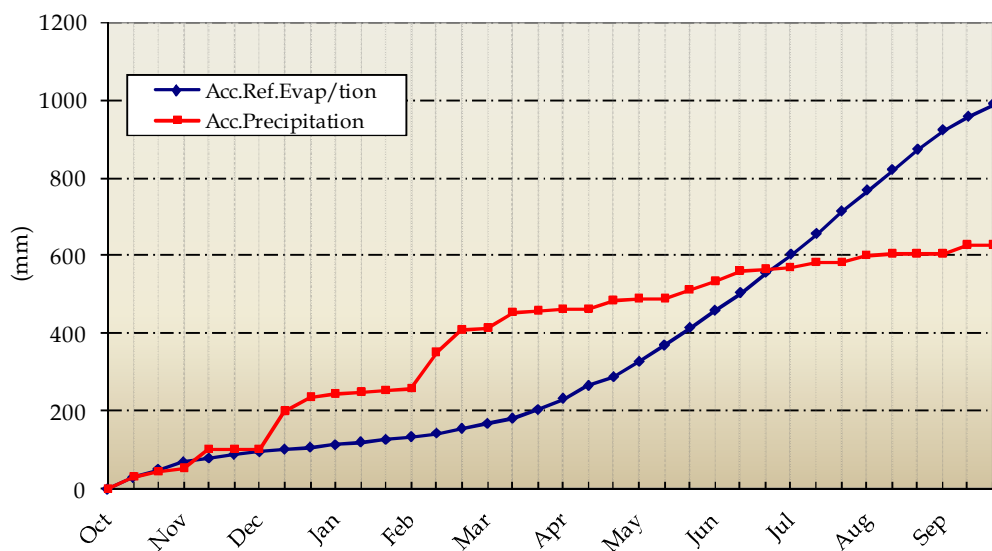


Trikala Imathias

2nd 10-day period (11-20/09/2010)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	24.6	24.0	28.6	29.8	31.0	30.0	33.4	32.0	32.0	27.6	29.3	27.3	28.3
	Min	18.8	18.0	14.8	14.6	14.4	14.6	15.2	15.4	15.8	18.4	16.0	17.5	14.2
Relative Humidity	Max	94	94	92	91	95	100	96	100	96	94	95	95	-
	Min	59	56	32	33	28	35	35	32	39	30	38	46	-
Soil Temperature at 10 cm	06 UTC	23.8	23.0	21.6	22.0	21.6	22.2	22.2	22.4	22.8	23.2	22.5	22.4	21.6
	12 UTC	24.8	23.4	23.8	24.0	24.4	24.2	24.4	24.8	23.8	25.0	24.3	24.4	22.8
Sunshine Duration		0.8	0.2	10.6	8.5	10.4	10.0	10.2	9.8	9.6	10.1	8.0	4.6	7.7
Precipitation													11.3	4.6
Evaporation		1.8	2.1	3.3	2.7	3.3	3.3	3.5	1.6	3.4	6.2	31.2	22.2	39.1
Growing Degrees	5	16.7	16.0	16.7	17.2	17.7	17.3	19.3	18.7	18.9	18.0	176.5	173.7	162.6
	10	11.7	11.0	11.7	12.2	12.7	12.3	14.3	13.7	13.9	13.0	126.5	123.7	112.6

2nd 10-day period (11-20/09/2010)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	32.4	31.1	30.4
Precipitation - Reference Evapotranspiration	-32.4	-19.8	-25.8
Number of Rainy Days	0.0	7.0	1.2
Number of Dry Days	16.0	2.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

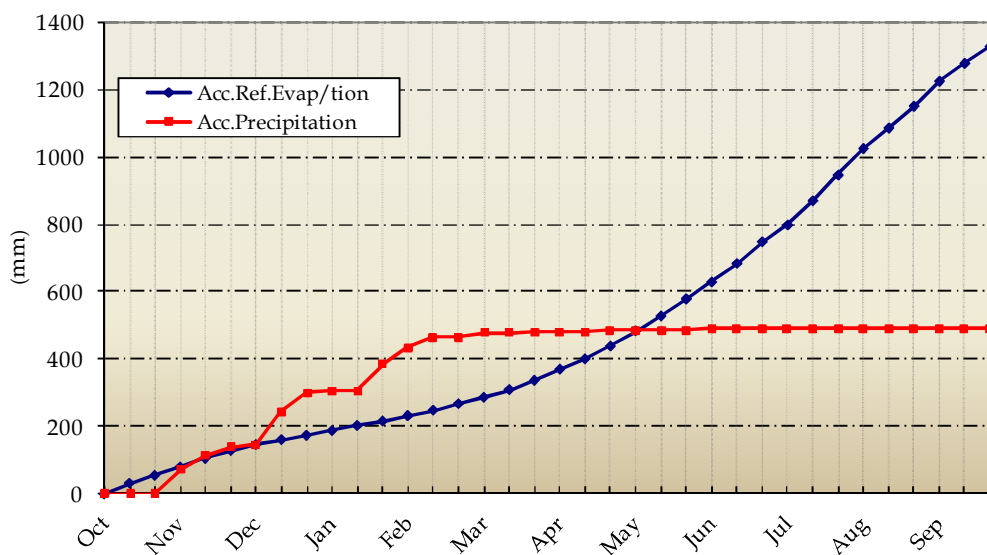


Tympaki

2nd 10-day period (11-20/09/2010)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	29.0	28.0	29.4	29.4	30.0	29.2	31.6	30.8	30.4	29.8	29.8	27.7	28.9
	Min	19.0	20.8	18.2	17.6	17.6	17.4	17.6	17.0	19.0	15.8	18.0	20.1	18.0
Relative Humidity	Max	91	96	91	99	72	88	87	79	97	97	90	86	-
	Min	45	54	44	33	35	39	30	33	26	30	37	42	-
Soil Temperature at 10 cm	06 UTC	26.4	27.4	26.8	26.4	26.0	25.6	26.0	25.8	26.2	26.0	26.3	25.0	27.0
	12 UTC	31.6	31.2	31.2	31.6	30.8	31.2	30.6	31.0	31.4	31.4	31.2	29.3	30.9
Sunshine Duration		10.8	9.1	9.8	11.2	10.5	10.9	10.5	10.6	10.7	10.6	10.5	6.8	9.8
Precipitation			0.1									0.1	79.9	2.3
Evaporation		6.1	9.6	7.5	10.4	10.7	9.5	9.3	9.6	6.4	7.1	86.2	71.3	80.7
Growing Degrees	5	19.0	19.4	18.8	18.5	18.8	18.3	19.6	18.9	19.7	17.8	188.8	188.7	184.3
	10	14.0	14.4	13.8	13.5	13.8	13.3	14.6	13.9	14.7	12.8	138.8	138.7	134.3

2nd 10-day period (11-20/09/2010)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	51.2	35.6	45.0
Precipitation - Reference Evapotranspiration	-51.1	44.3	-42.7
Number of Rainy Days	1.0	1.0	0.2
Number of Dry Days	98.0	129.0	-

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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