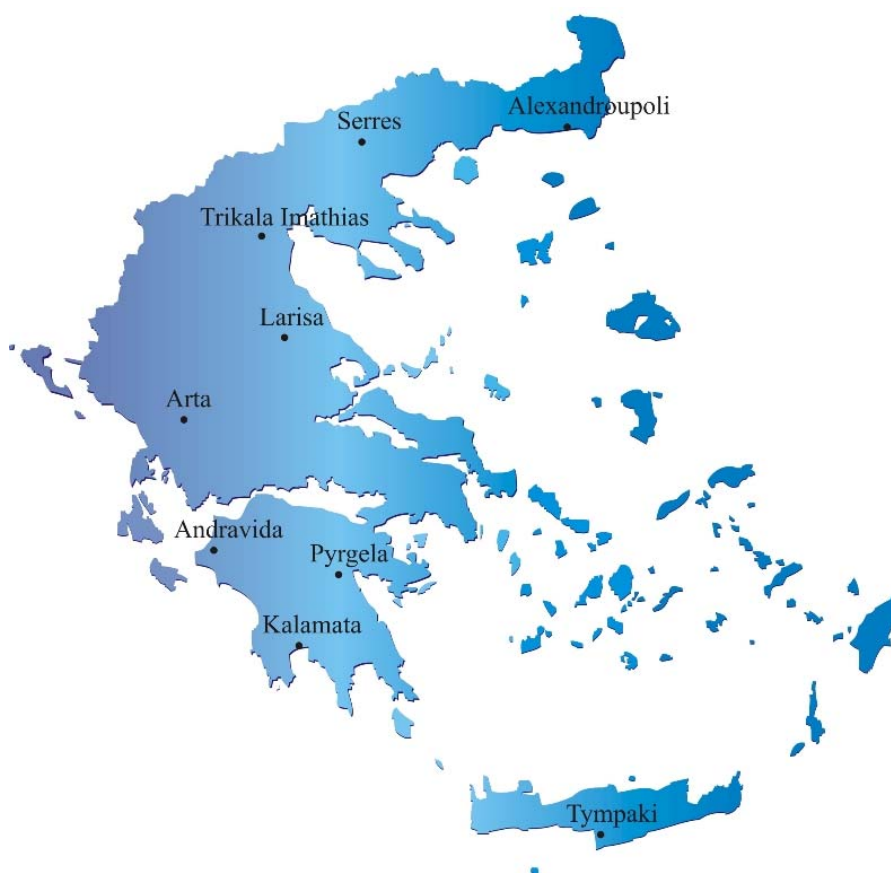




# AGROMETEOROLOGICAL BULLETIN

*September 2010*  
*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



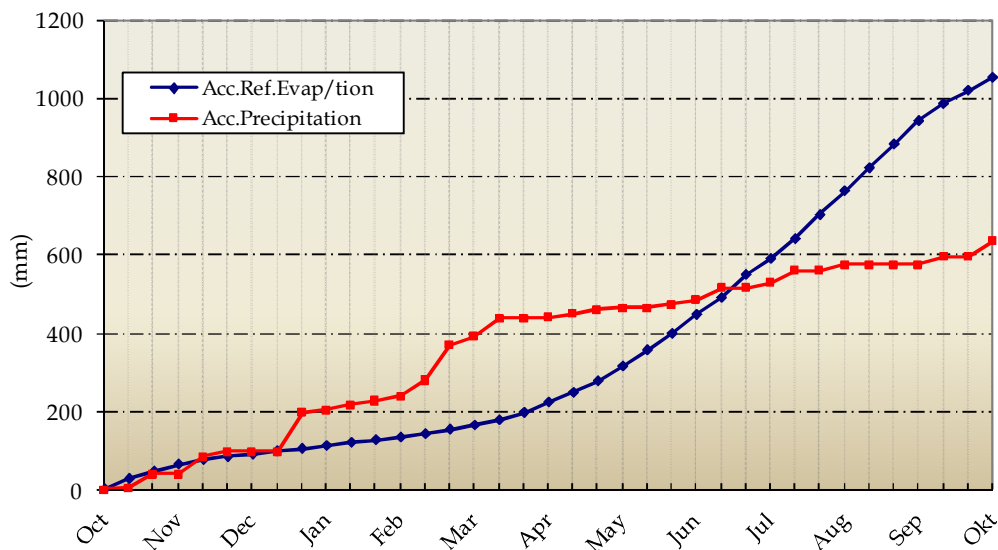
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*Web addresses of HNMS*  
[www.hnms.gr](http://www.hnms.gr)  
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[www.meteo.gov.gr](http://www.meteo.gov.gr)  
[www.meteohellas.gr](http://www.meteohellas.gr)

3rd 10-day period (21-30/09/2010)		21	22	23	24	25	26	27	28	29	30	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	27.0	25.4	26.8	23.8	25.4	26.8	26.0	26.0	24.8	20.6	25.3	24.7	24.9
	Min	18.0	13.0	16.8	18.4	17.6	21.4	20.2	17.0	18.0	15.4	17.6	12.7	13.0
Relative Humidity	Max	80	82	66	72	85	88	94	90	94	96	85	85	-
	Min	33	29	30	50	59	70	54	65	70	35	50	37	-
Soil Temperature at 10 cm	06 UTC	23.2	22.2	22.0	22.4	21.8	23.4	23.2	23.0	23.2	21.2	22.6	19.1	19.0
	12 UTC	25.2	24.0	23.6	23.2	23.6	25.2	25.2	25.4	24.4	21.0	24.1	22.6	22.4
Sunshine Duration		10.6	10.8	8.9	2.5	7.0	7.6	9.8	8.4	5.6	4.4	7.6	9.4	7.5
Precipitation		0.0					0.4			20.2	18.2	38.8		12.3
Evaporation		6.7	7.7	9.2	2.9	3.7	4.5	5.4	4.7	0.5	1.9	47.2	56.7	59.3
Growing Degrees	5	17.5	14.2	16.8	16.1	16.5	19.1	18.1	16.5	16.4	13.0	164.2	137.0	139.4
	10	12.5	9.2	11.8	11.1	11.5	14.1	13.1	11.5	11.4	8.0	114.2	87.0	89.4

3rd 10-day period (21-30/09/2010)	Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	33.3	31.4
Precipitation - Reference Evapotranspiration	5.5	-31.4
Number of Rainy Days	3.0	0.0
Number of Dry Days	24.0	18.0

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

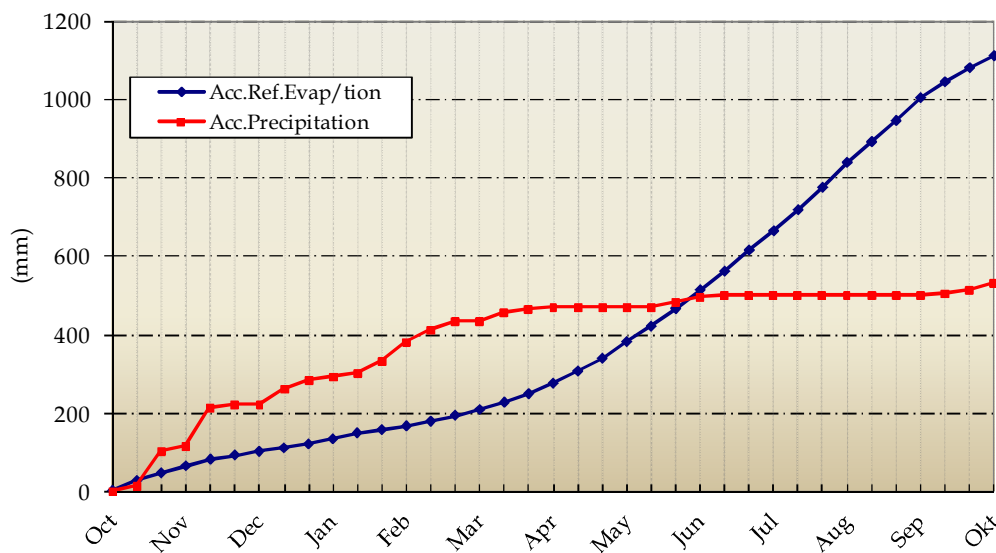


Andravida

3rd 10-day period (21-30/09/2010)		21	22	23	24	25	26	27	28	29	30	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	30.6	29.8	26.2	27.2	25.8	27.0	27.2	26.6	27.0	24.6	27.2	26.1	27.0
	Min	19.2	21.2	16.6	17.6	19.0	20.0	17.8	18.8	20.0	17.0	18.7	15.5	15.6
Relative Humidity	Max	94	96	90	84	96	98	94	96	96	91	94	94	-
	Min	41	33	34	41	59	58	51	48	64	45	47	44	-
Soil Temperature at 10 cm	06 UTC	24.4	26.0	24.0	23.2	24.2	22.0	21.2	20.8	22.2	20.4	22.8	20.6	22.0
	12 UTC	32.2	30.2	28.8	30.2	25.2	25.4	26.0	25.4	26.0	26.2	27.6	26.5	25.5
Sunshine Duration		9.5	4.7	4.3	5.2	2.0	8.4	7.9	2.5	3.8	10.0	5.8	6.1	8.1
Precipitation			0.1			9.4	7.5		1.2	0.8		19.0	20.8	16.0
Evaporation		1.8	8.9	5.6	7.2	6.6	4.9	2.9	0.1	5.1	5.9	49.0	47.2	48.4
Growing Degrees	5	19.9	20.5	16.4	17.4	17.4	18.5	17.5	17.7	18.5	15.8	179.6	157.7	162.7
	10	14.9	15.5	11.4	12.4	12.4	13.5	12.5	12.7	13.5	10.8	129.6	107.7	112.7

3rd 10-day period (21-30/09/2010)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	30.8	25.6	30.8
Precipitation - Reference Evapotranspiration	-11.8	-4.8	-14.8
Number of Rainy Days	5.0	2.0	1.5
Number of Dry Days	9.0	4.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

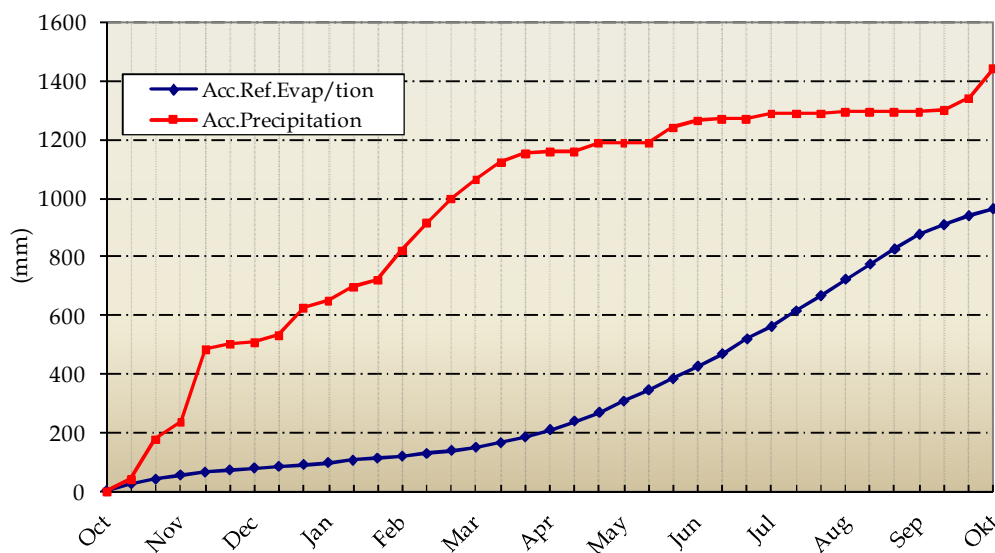




3rd 10-day period (21-30/09/2010)		21	22	23	24	25	26	27	28	29	30	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	32.0	29.0	29.0	30.0	22.0	26.4	26.6	25.6	25.6	25.0	27.1	26.9	27.4
	Min	16.4	20.2	14.2	12.6	18.0	18.4	17.0	17.4	18.8	12.0	16.5	14.5	14.5
Relative Humidity	Max	95	82	95	95	98	98	98	98	96	95	95	86	-
	Min	27	45	21	29	90	65	45	64	46	51	48	38	-
Soil Temperature at 10 cm	06 UTC	24.0	24.8	23.2	21.8	24.0	21.4	22.2	22.6	22.6	21.0	22.8	21.3	20.6
	12 UTC	25.8	26.0	24.8	24.4	24.0	22.4	23.6	23.4	23.2	22.2	24.0	23.8	24.1
Sunshine Duration		9.1	3.4	9.6	6.5	0.0	6.5	9.6	2.1	3.0	10.1	6.0	7.0	7.7
Precipitation						40.7	19.6	10.1	26.3	5.5		102.2	7.3	21.5
Evaporation		4.6	3.7	5.8	4.0	0.6	3.2	3.5	1.2	2.1	4.1	32.8	38.0	-
Growing Degrees	5	19.2	19.6	16.6	16.3	15.0	17.4	16.8	16.5	17.2	13.5	168.1	156.8	159.3
	10	14.2	14.6	11.6	11.3	10.0	12.4	11.8	11.5	12.2	8.5	118.1	106.8	109.5

3rd 10-day period (21-30/09/2010)	Previous Year Value	Past Years Mean Value	
Reference Evapotranspiration	23.8	25.4	27.2
Precipitation - Reference Evapotranspiration	78.4	-18.1	-5.7
Number of Rainy Days	5.0	2.0	1.8
Number of Dry Days	12.0	5.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

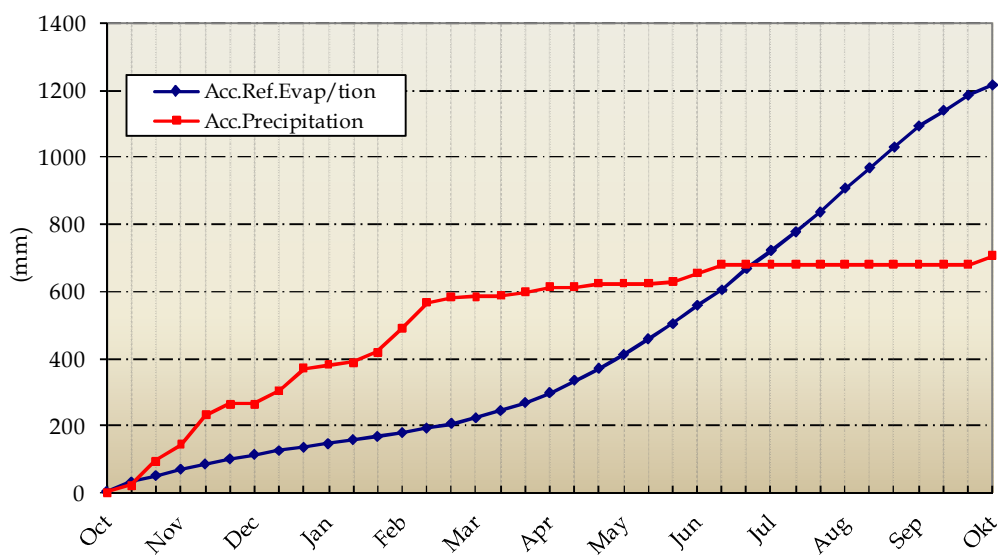


Kalamata

3rd 10-day period (21-30/09/2010)		21	22	23	24	25	26	27	28	29	30	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	29.4	27.8	26.8	26.8	26.2	28.6	28.0	25.0	28.0	28.4	27.5	26.0	27.6
	Min	17.2	20.0	15.6	15.0	21.0	19.8	15.0	16.6	19.8	15.8	17.6	15.6	15.0
Relative Humidity	Max	94	94	94	96	95	96	96	94	90	91	94	92	-
	Min	54	44	38	49	65	51	40	67	72	30	51	48	-
Soil Temperature at 10 cm	06 UTC	24.6	24.6	24.8	24.6	23.0	22.8	22.8	22.4	22.4	22.2	23.4	20.9	21.4
	12 UTC	26.0	25.2	24.2	23.6	24.0	24.6	24.0	22.6	24.0	23.2	24.1	22.2	24.4
Sunshine Duration		9.6	1.7	4.3	6.5	3.7	9.4	9.1	0.5	2.6	10.2	5.8	8.0	7.7
Precipitation			0.2	4.7		3.1	14.6		0.5	0.3	0.0	23.4	12.2	12.3
Evaporation		7.0	2.4	0.3	3.0	3.8	5.5	4.0	1.8	2.0	6.3	36.1	38.4	51.4
Growing Degrees	5	18.3	18.9	16.2	15.9	18.6	19.2	16.5	15.8	18.9	17.1	175.4	158.2	162.8
	10	13.3	13.9	11.2	10.9	13.6	14.2	11.5	10.8	13.9	12.1	125.4	108.2	112.8

3rd 10-day period (21-30/09/2010)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	30.1	31.4	32.9
Precipitation - Reference Evapotranspiration	-6.7	-19.2	-20.6
Number of Rainy Days	6.0	2.0	1.7
Number of Dry Days	7.0	5.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

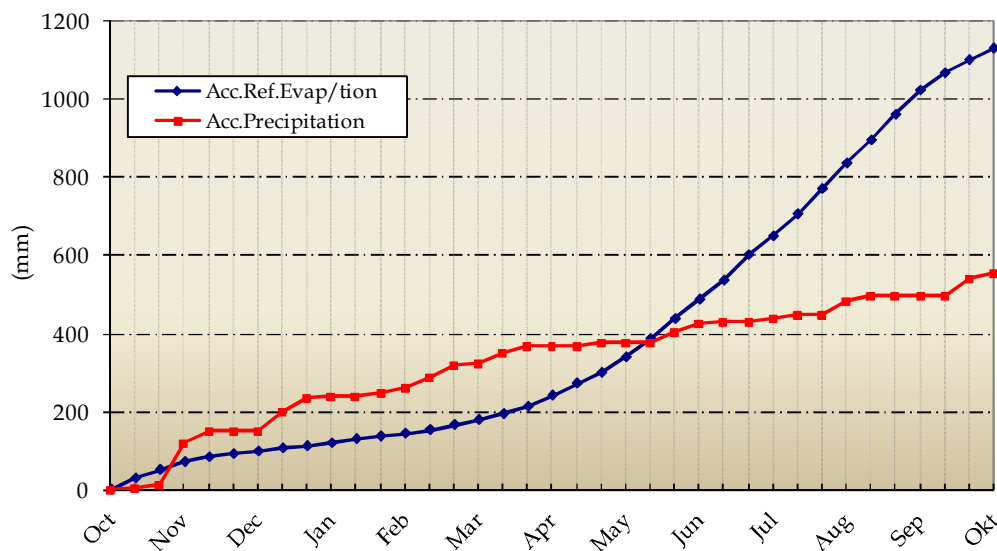


Larisa

3rd 10-day period (21-30/09/2010)		21	22	23	24	25	26	27	28	29	30	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	24.0	24.2	24.8	24.4	24.0	30.0	28.6	29.0	26.8	25.6	26.1	25.5	27.3
	Min	15.6	16.8	12.0	17.8	17.8	17.6	15.6	17.0	17.8	14.2	16.2	12.8	13.0
Relative Humidity	Max	73	85	89	83	92	96	77	96	98	89	88	89	-
	Min	49	52	36	50	60	28	28	37	55	36	43	38	-
Soil Temperature at 10 cm	06 UTC	24.0	21.4	21.6	22.2	22.4	22.0	21.4	21.6	22.4	21.0	22.0	20.3	20.9
	12 UTC	24.2	23.6	23.4	24.0	23.2	24.0	23.4	23.6	23.4	22.4	23.5	22.4	22.7
Sunshine Duration		1.3	3.6	8.6	3.7	0.1	7.5	6.8	7.3	4.9	8.4	5.2	6.3	7.0
Precipitation			0.0			0.4	1.2		0.7	11.2		13.5	0.4	7.0
Evaporation		7.0	1.6	6.4	2.4	0.6	4.7	5.0	8.4	3.5	1.3	40.9	42.0	51.2
Growing Degrees	5	14.8	15.5	13.4	16.1	15.9	18.8	17.1	18.0	17.3	14.9	161.8	141.8	151.5
	10	9.8	10.5	8.4	11.1	10.9	13.8	12.1	13.0	12.3	9.9	111.8	91.8	101.5

3rd 10-day period (21-30/09/2010)	Previous Year Value	Past Years Mean Value	
Reference Evapotranspiration	29.4	29.7	31.7
Precipitation - Reference Evapotranspiration	-15.9	-29.3	-24.7
Number of Rainy Days	4.0	2.0	1.7
Number of Dry Days	11.0	5.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

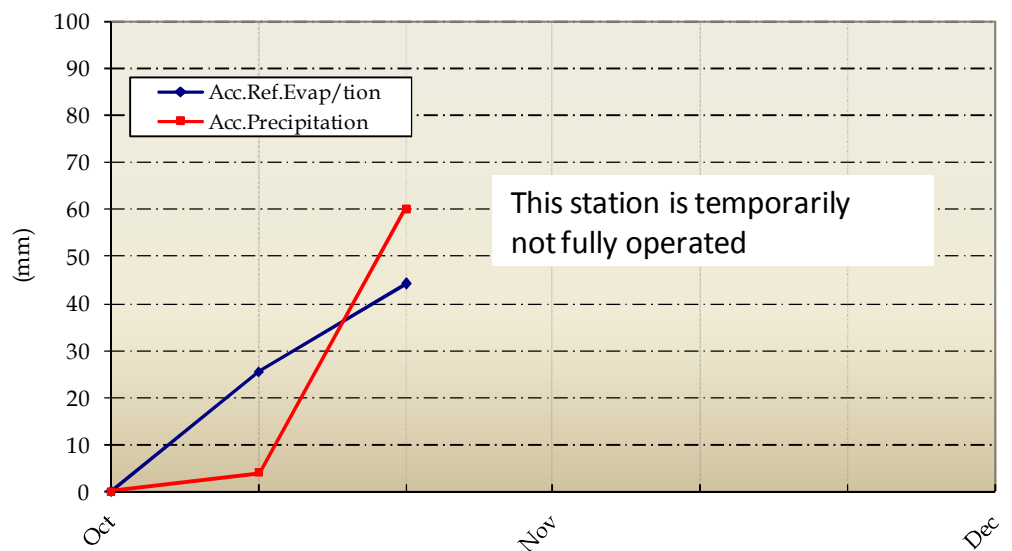


Pyrgela

3rd 10-day period (21-30/09/2010)		21	22	23	24	25	26	27	28	29	30	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	-	-	-	-	-	-	-	-	-	-	-	26.1	28.5
	Min	19.4	19.2	13.2	14.0	20.0	20.8	14.2	15.0	16.2	13.0	16.5	12.6	13.3
Relative Humidity	Max	68	71	63	90	94	60	74	90	94	74	78	82	-
	Min	38	48	32	38	85	32	28	46	36	17	40	40	-
Soil Temperature at 10 cm	06 UTC	23.4	24.0	20.2	21.2	23.4	22.8	22.0	22.0	21.6	21.0	22.2	18.3	20.4
	12 UTC	29.0	25.0	26.4	27.2	25.2	28.0	26.4	25.4	26.6	27.4	26.7	23.4	26.9
Sunshine Duration		7.1	1.0	9.1	5.4	3.0	5.5	8.6	2.1	6.6	9.6	5.8	6.7	7.6
Precipitation						2.4						2.4	3.2	6.5
Evaporation		1.8	2.8	2.2	1.4	2.4	1.4	4.0	2.6	5.2	3.8	27.6	32.8	37.6
Growing Degrees	5	-	-	-	-	-	-	-	-	-	-	-	143.6	157.4
	10	-	-	-	-	-	-	-	-	-	-	-	93.6	107.9

3rd 10-day period (21-30/09/2010)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	-	25.4	28.2
Precipitation - Reference Evapotranspiration	-	-22.2	-21.7
Number of Rainy Days	1.0	2.0	1.5
Number of Dry Days	-	5.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

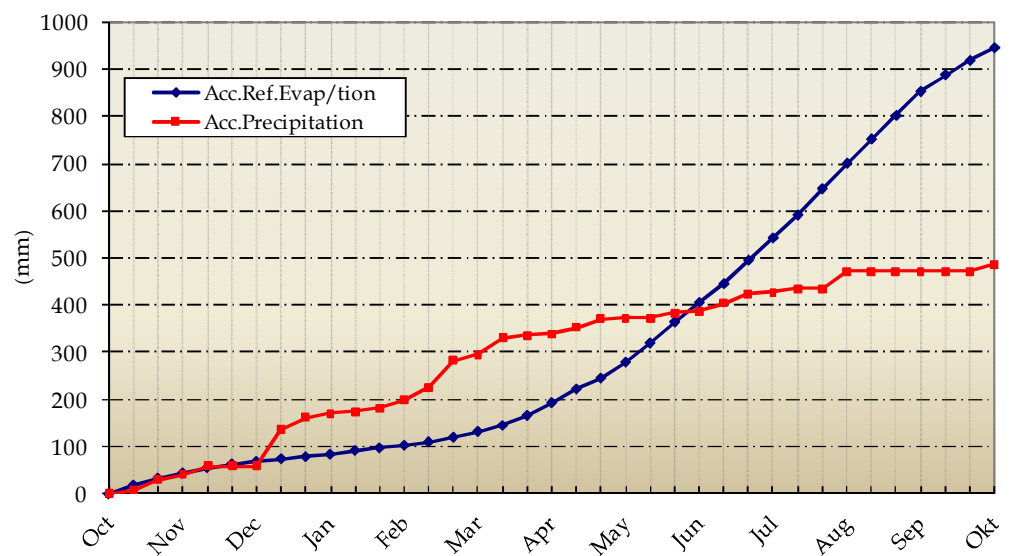


Series

3rd 10-day period (21-30/09/2010)		21	22	23	24	25	26	27	28	29	30	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	28.0	28.4	29.0	27.6	24.8	31.4	30.0	30.8	24.8	24.8	28.0	26.5	26.8
	Min	18.6	17.8	11.0	11.8	17.0	18.8	15.2	12.6	18.4	15.8	15.7	12.9	13.1
Relative Humidity	Max	58	55	76	74	96	83	83	79	85	45	73	84	-
	Min	32	32	25	28	48	31	30	29	58	27	34	35	-
Soil Temperature at 10 cm	06 UTC	25.8	24.8	23.4	23.2	24.0	23.6	21.4	21.4	23.2	20.2	23.1	19.4	19.3
	12 UTC	25.6	25.6	24.0	24.0	24.6	25.2	23.4	23.8	23.6	22.2	24.2	22.2	22.2
Sunshine Duration		4.5	8.5	8.4	6.8	0.1	6.5	8.2	8.5	1.3	9.4	6.2	7.9	7.2
Precipitation						6.0	1.0			7.1		14.1		6.6
Evaporation		3.3	4.6	4.1	2.7	1.5	3.0	2.8	3.3	2.0	5.0	32.3	40.0	38.3
Growing Degrees	5	18.3	18.1	15.0	14.7	15.9	20.1	17.6	16.7	16.6	15.3	168.3	147.0	147.0
	10	13.3	13.1	10.0	9.7	10.9	15.1	12.6	11.7	11.6	10.3	118.3	97.0	97.8

3rd 10-day period (21-30/09/2010)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	26.6	21.9	24.2
Precipitation - Reference Evapotranspiration	-12.5	-21.9	-17.6
Number of Rainy Days	3.0	0.0	1.7
Number of Dry Days	13.0	11.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



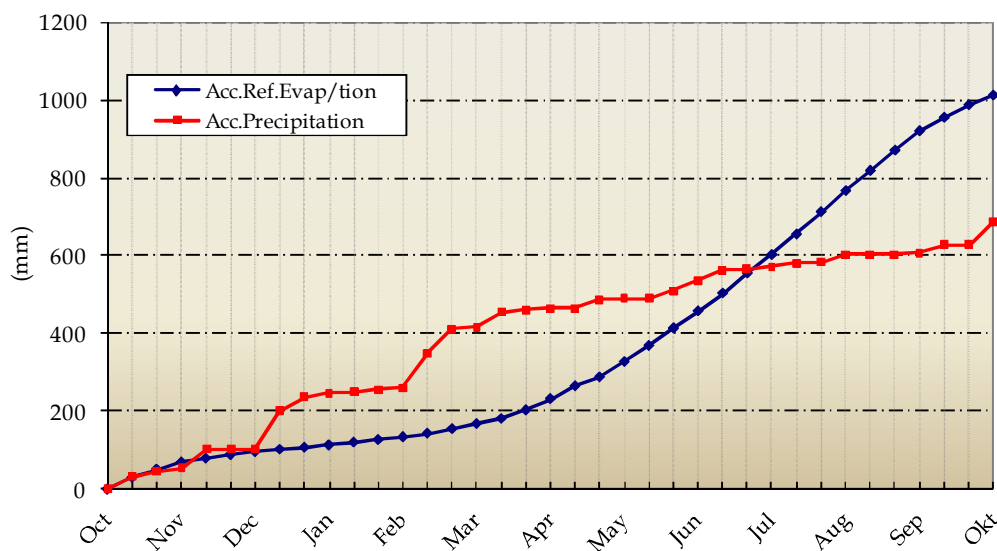


Trikala Imathias

3rd 10-day period (21-30/09/2010)		21	22	23	24	25	26	27	28	29	30	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	27.8	27.2	28.6	26.8	19.8	29.4	29.0	29.6	22.4	23.6	26.4	28.5	26.5
	Min	16.6	15.4	15.2	14.0	16.8	16.6	12.6	15.2	18.0	11.2	15.2	14.3	13.4
Relative Humidity	Max	92	100	93	100	96	98	96	99	94	84	95	94	-
	Min	38	43	25	35	94	39	35	35	78	32	45	34	-
Soil Temperature at 10 cm	06 UTC	22.4	22.2	21.4	21.8	22.0	20.2	19.4	20.2	21.6	19.4	21.1	21.5	20.5
	12 UTC	23.4	24.0	23.6	23.4	21.8	23.0	21.6	22.8	22.4	21.0	22.7	24.4	21.6
Sunshine Duration		4.6	6.9	9.5	4.8	0.0	6.3	8.7	6.2	1.9	10.4	5.9	7.6	6.8
Precipitation						33.5	20.1		0.2	6.3		60.1		6.9
Evaporation		2.2	3.8	3.0	2.8	0.7	5.1	3.6	2.6	2.7	2.3	28.8	38.7	34.1
Growing Degrees	5	17.2	16.3	16.9	15.4	13.3	18.0	15.8	17.4	15.2	12.4	157.9	163.9	149.0
	10	12.2	11.3	11.9	10.4	8.3	13.0	10.8	12.4	10.2	7.4	107.9	113.9	99.2

3rd 10-day period (21-30/09/2010)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	24.9	33.0	25.6
Precipitation - Reference Evapotranspiration	35.2	-33.0	-18.7
Number of Rainy Days	4.0	0.0	1.6
Number of Dry Days	20.0	11.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

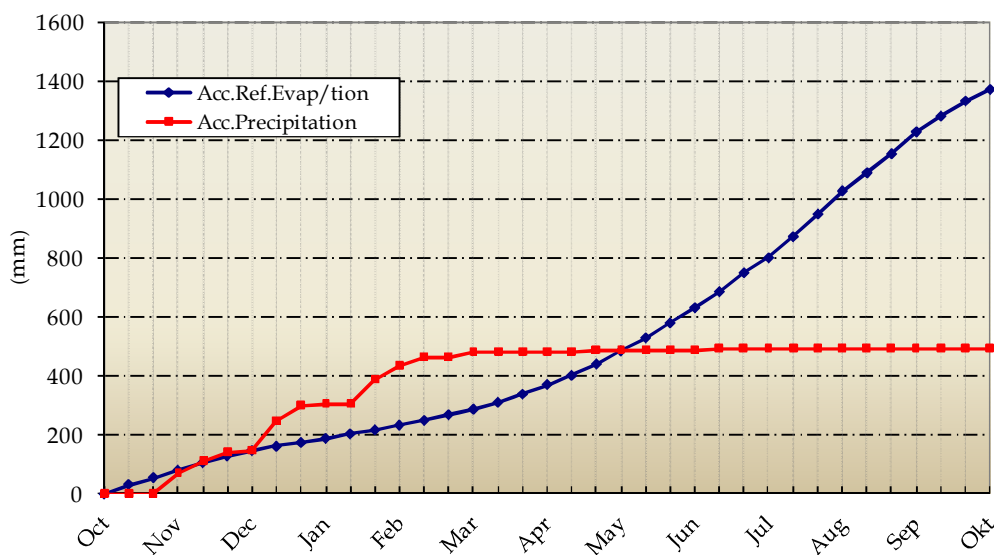


Tympaki

3rd 10-day period (21-30/09/2010)		21	22	23	24	25	26	27	28	29	30	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	32.8	29.8	29.4	28.0	30.8	29.6	28.6	27.8	32.0	26.8	29.6	26.8	27.8
	Min	20.2	20.0	18.4	18.0	20.6	24.4	18.4	18.2	20.2	22.6	20.1	17.1	17.1
Relative Humidity	Max	97	87	94	97	100	100	95	96	92	96	95	75	-
	Min	38	25	38	52	53	57	54	51	29	59	46	34	-
Soil Temperature at 10 cm	06 UTC	27.2	27.6	26.2	25.8	26.6	28.6	26.4	26.2	25.8	27.4	26.8	23.7	25.4
	12 UTC	32.0	30.6	30.2	28.8	31.0	31.8	31.0	31.0	31.4	28.4	30.6	28.7	29.1
Sunshine Duration		9.4	7.1	9.4	5.1	5.5	3.5	9.8	10.1	4.2	3.8	6.8	7.4	8.7
Precipitation											1.1	1.1	0.3	4.2
Evaporation		8.5	12.0	8.8	4.6	7.8	6.7	12.1	2.9	5.1	2.4	70.9	82.2	67.1
Growing Degrees	5	21.5	19.9	18.9	18.0	20.7	22.0	18.5	18.0	21.1	19.7	198.3	169.8	174.3
	10	16.5	14.9	13.9	13.0	15.7	17.0	13.5	13.0	16.1	14.7	148.3	119.8	124.3

3rd 10-day period (21-30/09/2010)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	39.2	37.3	38.0
Precipitation - Reference Evapotranspiration	-38.1	-37.0	-33.8
Number of Rainy Days	1.0	1.0	0.6
Number of Dry Days	17.0	13.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration





## ◆ List of Symbols and Abbreviations

### Reference Evapotranspiration $E_{To}$ (mm):

Calculated by the FAO Penman-Montieth equation

$$E_{T_0} = \frac{0.408 * \Delta * (R_n - G) + \gamma * \frac{900}{T + 273} * u_2 * (e_s - e_a)}{\Delta + \gamma * (1 + 0.34 * u_2)}$$

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.

### Mesurements 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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Helliniko, Athens



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ΜΕΤΕΩΡΟΛΟΓΙΚΗ  
ΥΠΗΡΕΣΙΑ

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