



# AGROMETEOROLOGICAL BULLETIN

*April 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

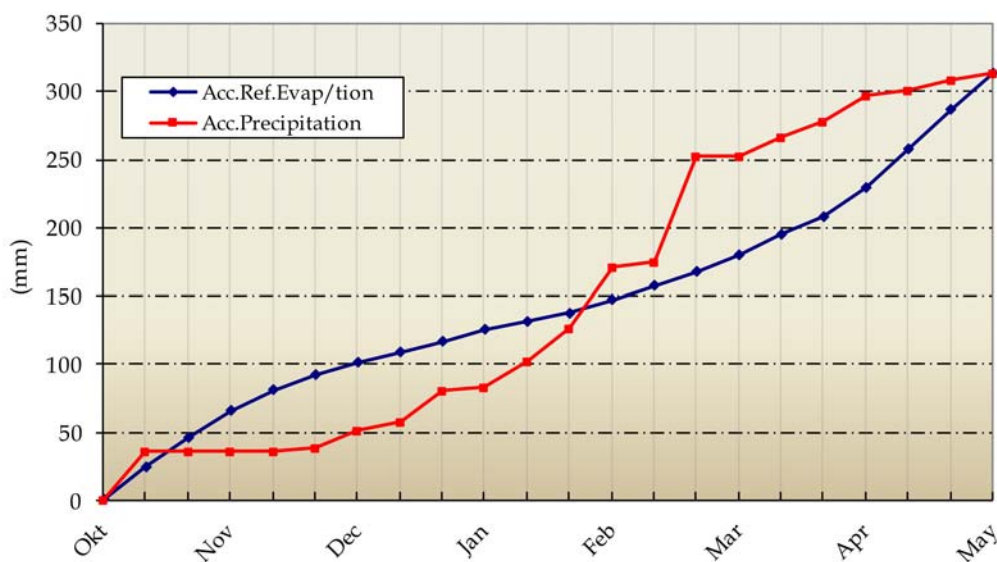
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Alexandroupoli

3rd 10-day period (21-30/04/2009)		21	22	23	24	25	26	27	28	29	30	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	22.2	18.8	16.0	17.4	16.0	14.6	15.4	15.6	15.6	18.0	17.0	-	18.4
	Min	10.2	9.4	8.0	3.4	2.6	7.8	4.0	3.6	10.6	6.8	6.6	-	7.8
Relative Humidity	Max	85	100	94	92	93	89	94	90	97	92	93	-	-
	Min	35	50	44	37	56	52	55	50	57	64	50	-	-
Soil Temperature at 10 cm	06 UTC	15.4	15.8	11.6	11.0	12.2	13.4	11.5	11.2	13.6	12.8	12.8	-	12.7
	12 UTC	18.4	15.0	15.2	15.0	15.8	15.0	14.6	14.6	15.8	17.0	15.6	-	16.6
Sunshine Duration		5.5	0.2	6.1	12.4	9.6	3.8	5.5	4.3	0.9	11.6	6.0	-	7.4
Precipitation			3.3	0.0		0.3	1.2			0.1		4.9	-	11.6
Evaporation		4.0	5.4	3.5	8.0	4.2	2.7	0.6	2.3	8.7	4.8	44.2	-	46.0
Growing Degrees	5	11.2	9.1	7.0	5.4	4.3	6.2	4.7	4.6	8.1	7.4	68.0	-	80.8
	10	6.2	4.1	2.0	0.4	0.0	1.2	0.0	0.0	3.1	2.4	19.4	-	32.3

3rd 10-day period (21-30/04/2009)	Previous Year Value	Past Years Mean Value	
Reference Evapotranspiration	26.6	-	31.2
Precipitation - Reference Evapotranspiration	-21.7	-	-19.6
Number of Rainy Days	4.0	-	2.2
Number of Dry Days	6.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

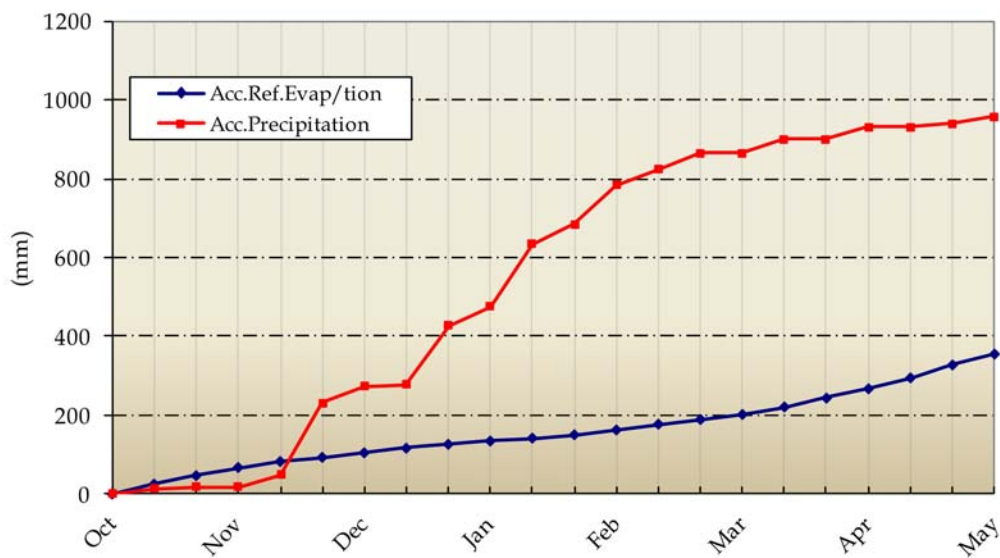


Andravida

3rd 10-day period (21-30/04/2009)		21	22	23	24	25	26	27	28	29	30	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	19.6	17.6	16.6	18.0	18.8	18.2	19.4	21.8	18.8	19.8	18.9	-	20.2
	Min	14.0	11.0	12.2	11.0	11.2	9.4	11.8	12.4	10.8	10.4	11.4	-	9.8
Relative Humidity	Max	93	97	98	97	95	98	98	95	100	98	97	-	-
	Min	53	68	77	52	65	66	63	45	66	59	61	-	-
Soil Temperature at 10 cm	06 UTC	17.6	16.4	17.0	16.0	16.2	16.4	17.2	16.4	16.0	16.2	16.5	-	15.0
	12 UTC	21.6	-	18.2	18.0	18.2	18.2	18.6	18.6	19.2	19.4	18.9	-	18.4
Sunshine Duration		6.0	7.2	0.0	2.9	10.5	5.6	0.5	4.2	9.7	10.4	5.7	-	8.8
Precipitation		1.0	4.5	13.5					0.5			19.5	-	8.8
Evaporation		0.0	6.5	3.7	1.5	3.5	4.1	1.4	1.6	3.5	2.3	28.1	-	43.9
Growing Degrees	5	11.8	9.3	9.4	9.5	10.0	8.8	10.6	12.1	9.8	10.1	101.4	-	100.1
	10	6.8	4.3	4.4	4.5	5.0	3.8	5.6	7.1	4.8	5.1	51.4	-	50.1

3rd 10-day period (21-30/04/2009)	Previous Year Value	Past Years Mean Value	
Reference Evapotranspiration	27.4	-	33.2
Precipitation - Reference Evapotranspiration	-7.9	-	-24.4
Number of Rainy Days	4.0	-	1.8
Number of Dry Days	6.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

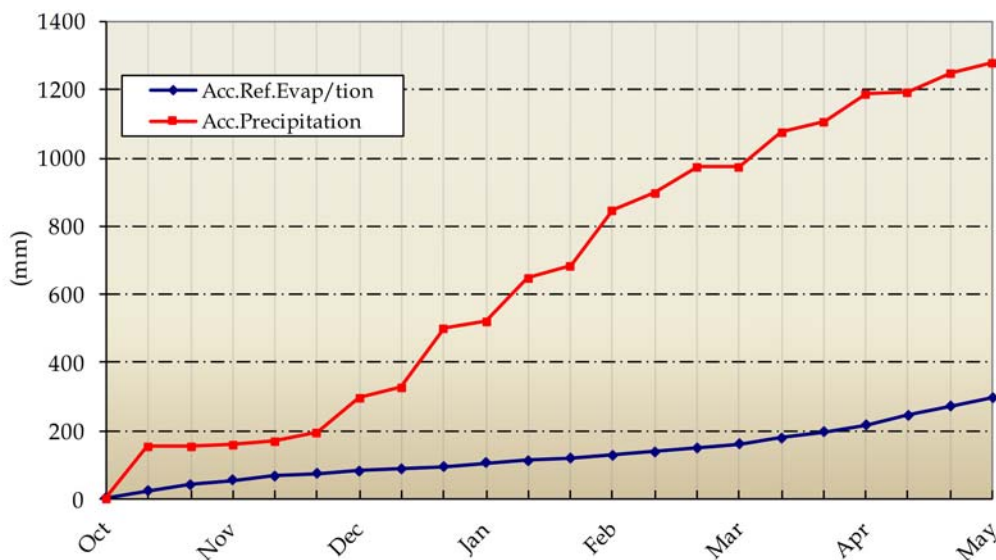


Arta

3rd 10-day period (21-30/04/2009)		21	22	23	24	25	26	27	28	29	30	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	20.0	20.4	20.0	18.4	20.8	21.0	19.0	-	18.2	20.4	19.8	-	21.2
	Min	13.6	11.8	11.6	12.4	10.4	9.4	10.6	13.8	7.6	-	11.2	-	9.1
Relative Humidity	Max	98	98	91	95	95	99	92	98	-	98	96	-	-
	Min	57	30	30	33	37	50	37	30	-	43	39	-	-
Soil Temperature at 10 cm	06 UTC	17.4	16.8	16.6	16.4	15.8	15.6	15.8	16.2	14.2	-	16.1	-	14.7
	12 UTC	17.6	-	18.0	17.2	19.0	17.2	17.4	17.0	15.6	17.0	17.3	-	18.8
Sunshine Duration		2.9	3.7	2.9	0.0	9.2	7.3	1.3	2.0	-	9.4	4.3	-	7.7
Precipitation		6.7	1.2	0.5	2.1				16.6	4.1		31.2	-	15.1
Evaporation		0.4	1.9	3.6	1.8	3.2	3.8	2.7	1.8	-	3.3	-	-	-
Growing Degrees	5	11.8	11.1	10.8	10.4	10.6	10.2	9.8	-	7.9	-	-	-	100.7
	10	6.8	6.1	5.8	5.4	5.6	5.2	4.8	-	2.9	-	-	-	51.2

3rd 10-day period (21-30/04/2009)	Previous Year Value	Past Years Mean Value	
Reference Evapotranspiration	24.5	-	31.1
Precipitation - Reference Evapotranspiration	6.7	-	-16.0
Number of Rainy Days	6.0	-	2.7
Number of Dry Days	5.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

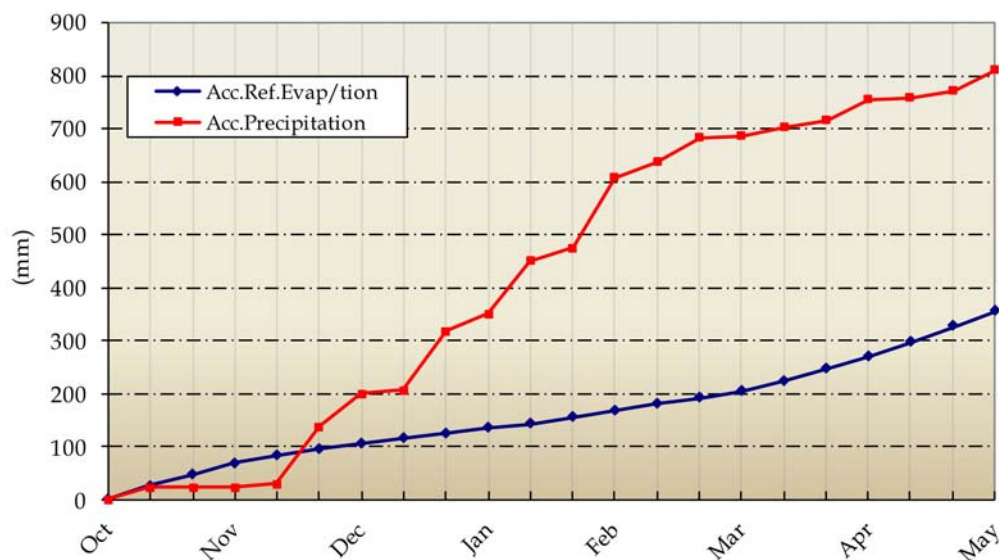


Kalamata

3rd 10-day period (21-30/04/2009)		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	18.0	15.2	19.8	19.4	20.0	19.2	22.6	21.0	24.0	20.3	-	20.8
	Min	13.4	11.0	12.0	10.0	9.8	9.4	10.0	12.0	12.2	8.2	10.8	-	9.1
Relative Humidity	Max	93	95	98	95	97	98	97	87	-	97	95	-	-
	Min	15	71	87	52	66	61	66	34	-	38	54	-	-
Soil Temperature at 10 cm	06 UTC	16.4	16.2	16.2	15.4	16.0	16.0	16.4	16.2	17.0	-	16.2	-	15.1
	12 UTC	17.6	16.2	16.2	16.8	17.0	16.0	16.2	16.4	17.0	16.6	16.6	-	18.5
Sunshine Duration		6.2	2.3	0.0	6.9	7.2	7.5	1.3	7.4	8.1	11.1	5.8	-	8.3
Precipitation			9.7	30.3	0.0	0.1						40.1	-	12.2
Evaporation		4.3	3.2	0.0	4.0	3.1	4.0	3.0	5.0	5.0	5.0	36.6	-	46.5
Growing Degrees	5	13.7	9.5	8.6	9.9	9.6	9.7	9.6	12.3	11.6	11.1	105.6	-	99.4
	10	8.7	4.5	3.6	4.9	4.6	4.7	4.6	7.3	6.6	6.1	55.6	-	49.4

3rd 10-day period (21-30/04/2009)	Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	28.2	- 34.1
Precipitation - Reference Evapotranspiration	11.9	- -21.9
Number of Rainy Days	3.0	- 2.6
Number of Dry Days	6.0	- -

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



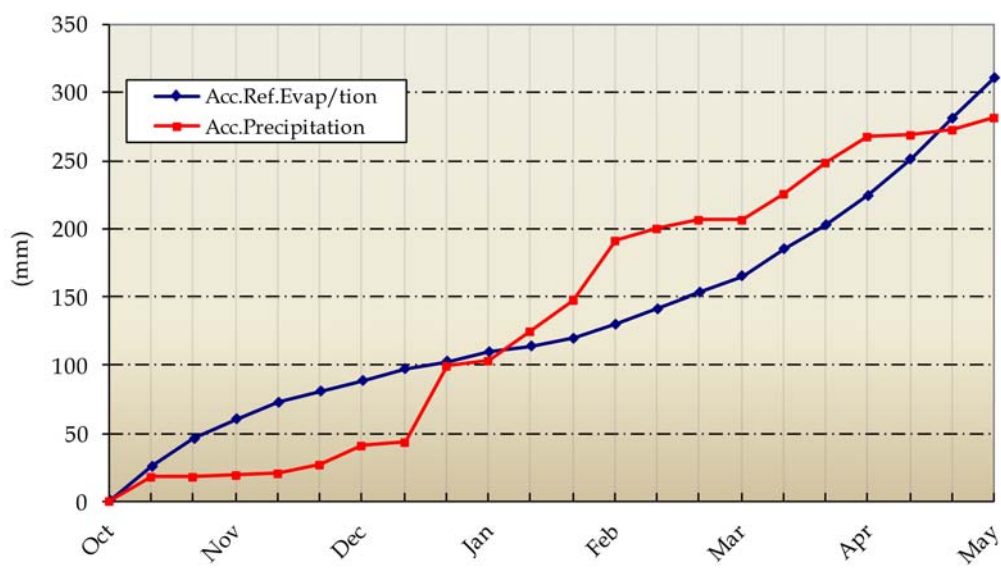


Larisa

3rd 10-day period (21-30/04/2009)		21	22	23	24	25	26	27	28	29	30	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	19.4	15.8	14.2	18.6	23.6	17.2	17.6	17.0	20.2	23.8	18.7	-	21.1
	Min	9.8	12.0	9.6	7.6	3.4	10.6	9.6	9.6	10.4	6.8	8.9	-	7.3
Relative Humidity	Max	90	90	90	88	93	95	97	95	95	97	93	-	-
	Min	56	60	57	38	27	56	46	43	49	31	46	-	-
Soil Temperature at 10 cm	06 UTC	15.6	15.8	14.4	13.8	13.4	15.4	15.0	15.2	14.8	14.8	14.8	-	14.2
	12 UTC	16.6	15.8	15.4	16.0	15.8	17.0	17.0	16.4	16.4	17.6	16.4	-	16.2
Sunshine Duration		1.8	0.2	0.0	9.0	12.1	4.7	6.4	1.2	8.1	9.8	5.3	-	7.9
Precipitation		0.0		0.2			0.0	2.7		5.2	0.6	8.7	-	10.7
Evaporation		4.0	1.7	1.4	3.6	5.5	3.1	3.5	2.5	2.9	5.9	34.1	-	43.9
Growing Degrees	5	9.6	8.9	6.9	8.1	8.5	8.9	8.6	8.3	10.3	10.3	88.4	-	91.9
	10	4.6	3.9	1.9	3.1	3.5	3.9	3.6	3.3	5.3	5.3	38.4	-	42.7

3rd 10-day period (21-30/04/2009)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	29.8	-	34.0
Precipitation - Reference Evapotranspiration	-21.1	-	-23.3
Number of Rainy Days	4.0	-	2.7
Number of Dry Days	7.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

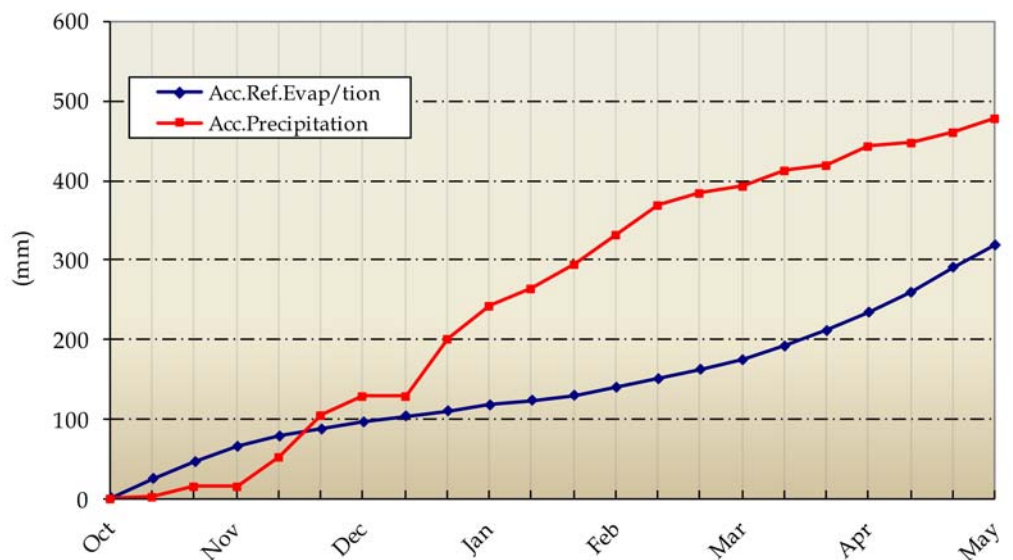


Pyrgela

3rd 10-day period (21-30/04/2009)		21	22	23	24	25	26	27	28	29	30	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	-	23.0	15.0	20.0	21.8	21.2	16.4	18.4	22.2	-	19.8	-	22.5
	Min	9.0	9.0	10.0	10.4	6.0	6.6	12.0	9.0	8.4	6.4	8.7	-	7.3
Relative Humidity	Max	89	93	93	93	95	93	93	95	93	82	92	-	-
	Min	28	34	92	45	40	53	66	49	42	31	48	-	-
Soil Temperature at 10 cm	06 UTC	16.0	15.4	15.2	14.2	13.2	13.2	16.0	14.0	15.0	13.8	14.6	-	14.2
	12 UTC	-	18.2	15.4	18.0	20.0	20.0	17.0	20.0	22.0	22.8	19.3	-	21.9
Sunshine Duration		7.0	7.7	0.0	4.8	6.4	8.2	0.0	6.9	8.0	11.6	6.1	-	7.7
Precipitation		0.3	6.1	9.8	0.3	0.3		1.3				18.1	-	9.5
Evaporation		4.9	3.3	0.0	2.6	2.0	5.3	0.8	4.2	3.2	5.8	32.1	-	42.3
Growing Degrees	5	-	11.0	7.5	10.2	8.9	8.9	9.2	8.7	10.3	-	-	-	98.7
	10	-	6.0	2.5	5.2	3.9	3.9	4.2	3.7	5.3	-	-	-	48.8

3rd 10-day period (21-30/04/2009)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	27.9	-	32.5
Precipitation - Reference Evapotranspiration	-9.8	-	-23.0
Number of Rainy Days	6.0	-	1.8
Number of Dry Days	5.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

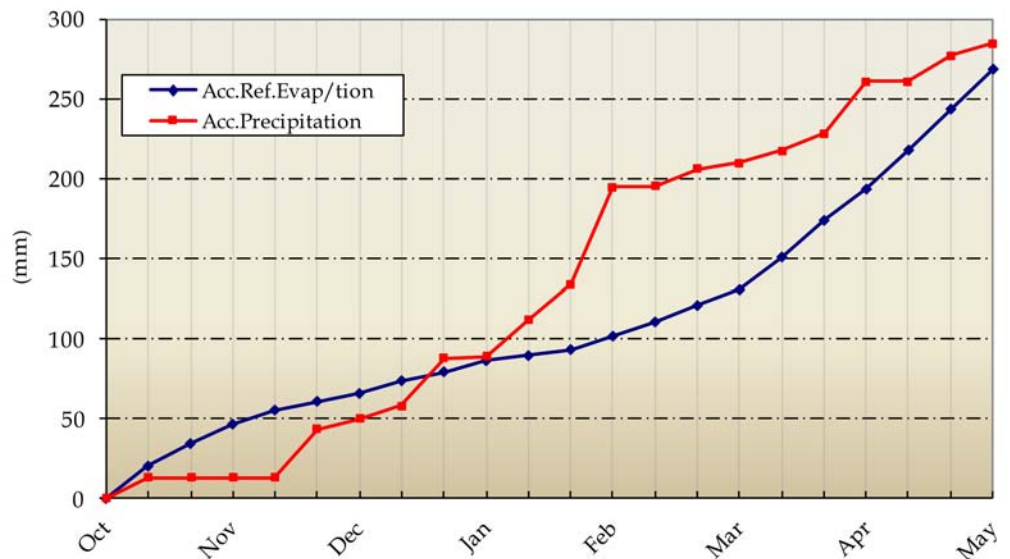


3rd 10-day period (21-30/04/2009)		21	22	23	24	25	26	27	28	29	30	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	-	15.0	18.8	21.4	24.0	15.0	-	15.4	17.4	23.4	18.8	-	21.1
	Min	10.4	-	10.0	5.4	5.6	11.0	4.4	7.2	9.8	9.8	8.2	-	8.8
Relative Humidity	Max	-	90	81	79	72	78	64	82	92	83	80	-	-
	Min	-	62	46	37	31	68	33	68	63	41	50	-	-
Soil Temperature at 10 cm	06 UTC	15.2	-	14.4	14.0	14.2	15.6	13.2	14.6	14.0	13.2	14.3	-	13.9
	12 UTC	16.8	15.6	16.2	16.0	17.0	15.6	14.6	14.4	14.4	14.4	15.5	-	17.2
Sunshine Duration		-	0.0	6.0	9.8	9.8	1.7	12.3	0.2	2.2	8.1	5.6	-	7.2
Precipitation			4.5						1.5	1.9		7.9	-	11.5
Evaporation		-	0.0	3.1	2.4	3.4	3.0	2.6	0.2	1.2	0.2	-	-	38.3
Growing Degrees	5	-	-	9.4	8.4	9.8	8.0	-	6.3	8.6	11.6	-	-	99.5
	10	-	-	4.4	3.4	4.8	3.0	-	1.3	3.6	6.6	-	-	49.8

Series

3rd 10-day period (21-30/04/2009)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	25.0	-	30.1
Precipitation - Reference Evapotranspiration	-17.1	-	-18.6
Number of Rainy Days	3.0	-	3.0
Number of Dry Days	6.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



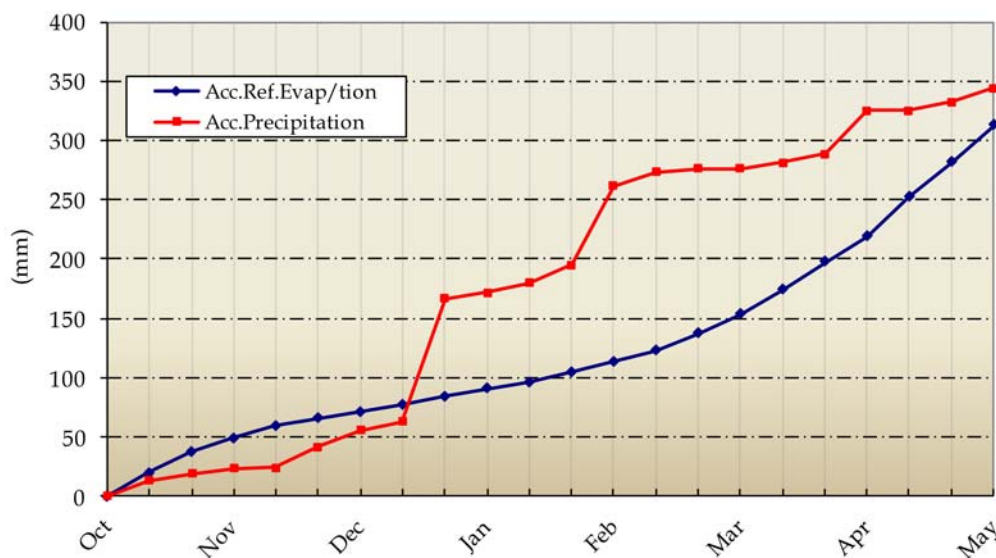


Trikala Imathias

3rd 10-day period (21-30/04/2009)		21	22	23	24	25	26	27	28	29	30	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	19.8	17.6	17.0	19.6	24.6	17.0	20.0	17.0	20.6	23.2	19.6	-	21.0
	Min	10.0	11.6	10.0	6.0	5.0	11.6	5.0	10.0	10.0	9.8	8.9	-	9.3
Relative Humidity	Max	99	96	97	95	94	93	95	88	95	93	94	-	-
	Min	62	82	46	26	27	63	32	52	38	38	47	-	-
Soil Temperature at 10 cm	06 UTC	15.6	15.4	14.0	13.0	13.0	16.0	13.2	15.0	14.4	15.2	14.5	-	14.6
	12 UTC	16.0	15.8	15.6	17.0	18.0	17.0	17.0	15.8	18.2	20.0	17.0	-	15.9
Sunshine Duration		0.6	0.0	7.4	10.9	10.4	0.2	9.2	0.2	11.4	8.4	5.9	-	7.0
Precipitation		0.1	8.9	0.5						2.8		12.3	-	16.5
Evaporation		12.3	4.2	1.6	3.0	3.4	3.4	0.0	0.0	0.0	3.2	31.1	-	39.7
Growing Degrees	5	9.9	9.6	8.5	7.8	9.8	9.3	7.5	8.5	10.3	11.5	92.7	-	101.6
	10	4.9	4.6	3.5	2.8	4.8	4.3	2.5	3.5	5.3	6.5	42.7	-	52.0

3rd 10-day period (21-30/04/2009)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	31.3	-	31.6
Precipitation - Reference Evapotranspiration	-19.0	-	-15.1
Number of Rainy Days	4.0	-	3.0
Number of Dry Days	6.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

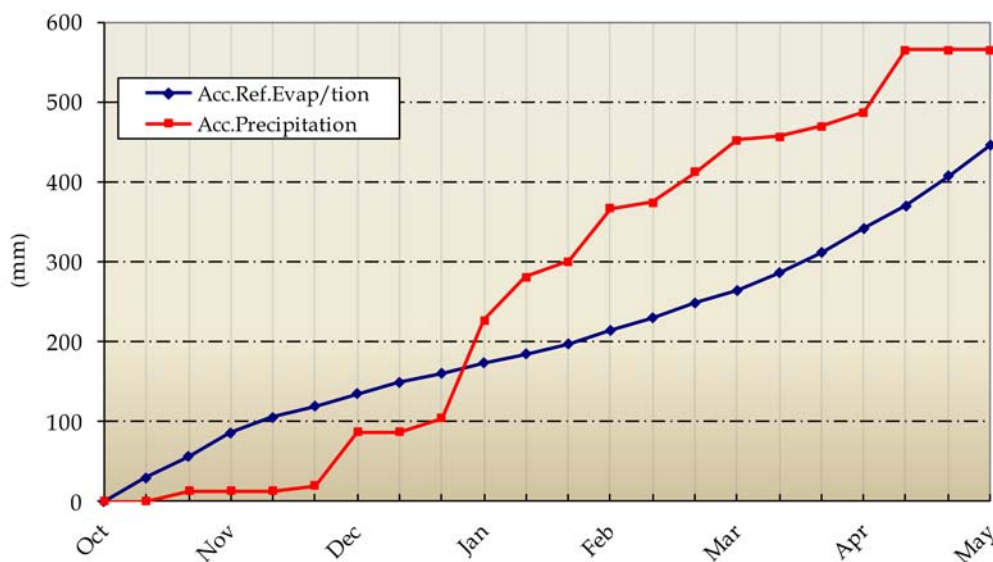


Tympaki

3rd 10-day period (21-30/04/2009)		21	22	23	24	25	26	27	28	29	30	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	26.4	21.0	19.2	21.0	19.8	19.8	22.0	22.6	20.8	19.4	21.2	-	21.4
	Min	7.8	15.6	13.8	10.4	11.6	11.0	10.6	11.4	12.2	10.8	11.5	-	11.1
Relative Humidity	Max	71	96	93	96	90	95	71	90	96	99	90	-	-
	Min	12	65	46	46	41	45	29	33	57	52	43	-	-
Soil Temperature at 10 cm	06 UTC	18.4	21.0	19.4	19.6	19.0	19.2	19.6	19.8	21.4	20.2	19.8	-	19.4
	12 UTC	25.8	25.4	25.2	25.0	25.2	25.8	25.8	26.4	27.0	26.2	25.8	-	24.1
Sunshine Duration		9.2	10.1	10.4	6.1	11.1	9.4	1.5	8.5	8.4	11.1	8.6	-	9.0
Precipitation													-	2.6
Evaporation		8.0	6.0	9.0	5.0	6.0	6.0	5.0	6.0	6.0	6.0	63.0	-	56.5
Growing Degrees	5	12.1	13.3	11.5	10.7	10.7	10.4	11.3	12.0	11.5	10.1	113.6	-	112.4
	10	7.1	8.3	6.5	5.7	5.7	5.4	6.3	7.0	6.5	5.1	63.6	-	62.4

3rd 10-day period (21-30/04/2009)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	38.5	-	36.3
Precipitation - Reference Evapotranspiration	-38.5	-	-33.7
Number of Rainy Days	0.0	-	0.6
Number of Dry Days	23.0	-	-

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.

**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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The present bulletin was designed and implemented under the support of Water Resources Management Division of Agriculture University of Athens (Professor A. Liakatas)