

# AGROMETEOROLOGICAL BULLETIN

*March 2009*  
*1st 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



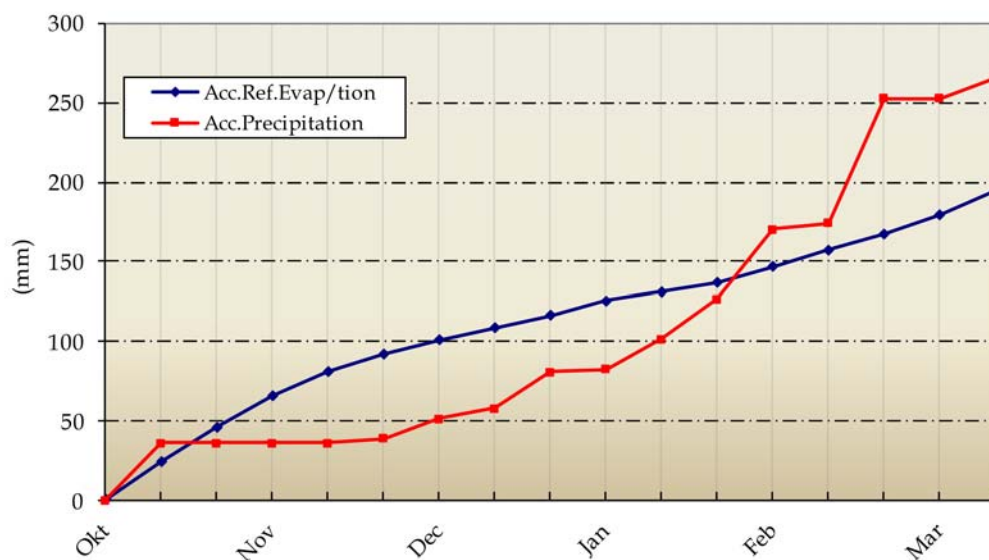
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1st 10-day period (1-10/03/2009)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	13.0	13.4	10.8	12.0	15.4	16.4	15.2	13.8	13.4	11.0	13.4	-	10.6
	Min	2.6	5.8	6.2	6.6	5.6	13.0	8.4	8.0	6.4	5.8	6.8	-	2.2
Relative Humidity	Max	87	92	94	94	97	87	89	91	94	97	92	-	-
	Min	55	75	74	69	77	65	68	64	52	68	67	-	-
Soil Temperature at 10 cm	06 UTC	5.6	7.6	8.6	8.5	8.2	10.4	11.4	9.6	9.6	9.0	8.8	-	5.9
	12 UTC	7.8	9.0	9.0	9.6	9.0	13.0	11.2	11.6	12.0	10.0	10.2	-	8.0
Sunshine Duration		4.0	0.7	0.6	1.9	0.0	4.5	4.4	5.9	9.7	1.1	3.3	-	4.8
Precipitation			0.0	0.0		0.6	0.0	7.5	2.0	0.0	3.2	13.3	-	16.7
Evaporation		1.5	0.5	0.8	1.6	1.2	2.9	0.6	2.7	1.4	0.2	13.4	-	18.5
Growing Degrees	5	2.8	4.6	3.5	4.3	5.5	9.7	6.8	5.9	4.9	3.4	51.4	-	22.8
	10	0.0	0.0	0.0	0.0	0.5	4.7	1.8	0.9	0.0	0.0	7.9	-	2.2

1st 10-day period (1-10/03/2009)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	15.1	-	16.2
Precipitation - Reference Evapotranspiration	-1.8	-	0.5
Number of Rainy Days	4.0	-	2.2
Number of Dry Days	12.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

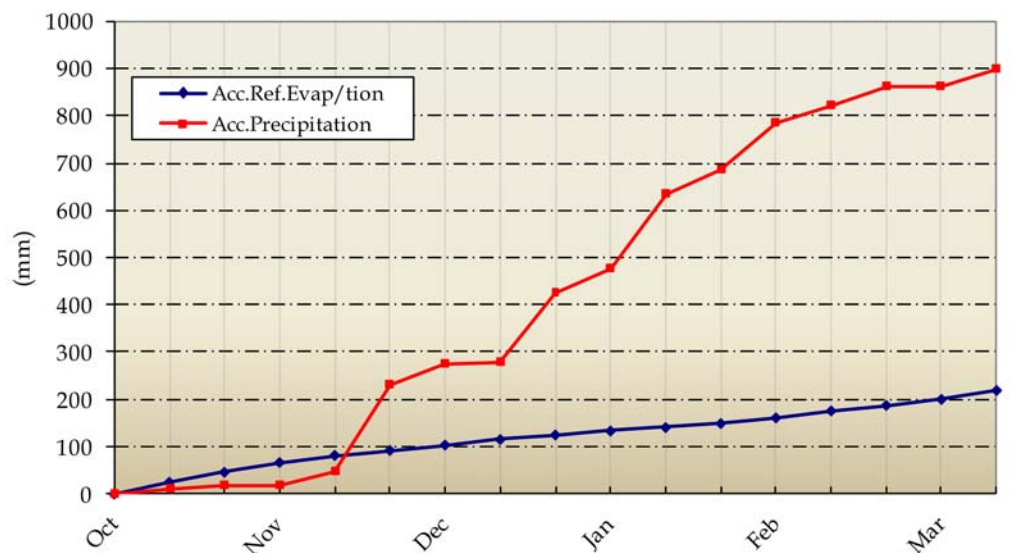


Andravida

1st 10-day period (1-10/03/2009)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	15.2	16.2	18.0	18.4	18.0	15.0	12.4	13.4	16.0	16.2	15.9	-	15.2
	Min	2.4	7.6	7.4	5.8	11.8	10.0	8.2	5.0	8.6	10.0	7.7	-	5.8
Relative Humidity	Max	89	92	97	97	98	97	97	97	90	91	94	-	-
	Min	47	60	65	49	68	64	71	64	52	49	59	-	-
Soil Temperature at 10 cm	06 UTC	8.4	9.8	10.4	11.2	13.0	12.8	10.8	10.0	11.0	12.0	10.9	-	10.0
	12 UTC	9.4	9.6	13.8	14.0	14.2	12.8	12.8	12.2	-	13.8	12.5	-	12.2
Sunshine Duration		4.7	5.1	7.9	6.6	2.8	1.6	0.0	6.4	8.6	9.5	5.3	-	6.1
Precipitation						10.5	11.3	11.8	1.0		0.5	35.1	-	26.8
Evaporation		1.0	1.0	2.0	2.5	2.3	0.0	7.8	9.5	5.2	0.8	32.1	-	25.2
Growing Degrees	5	3.8	6.9	7.7	7.1	9.9	7.5	5.3	4.2	7.3	8.1	67.8	-	55.6
	10	0.0	1.9	2.7	2.1	4.9	2.5	0.3	0.0	2.3	3.1	19.8	-	13.0

1st 10-day period (1-10/03/2009)	Previous Year Value	Past Years Mean Value	
Reference Evapotranspiration	18.9	-	18.0
Precipitation - Reference Evapotranspiration	16.2	-	8.8
Number of Rainy Days	5.0	-	3.2
Number of Dry Days	10.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

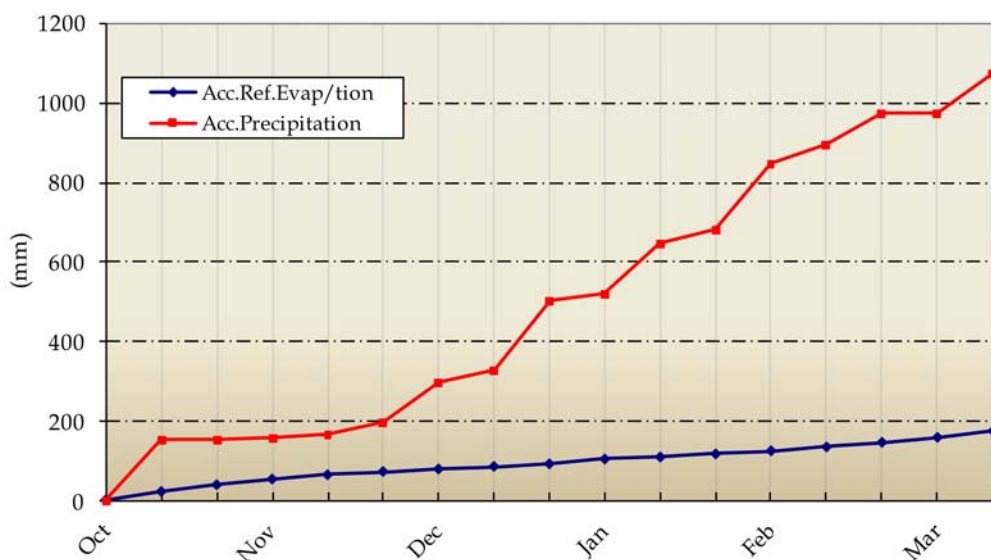


Arta

1st 10-day period (1-10/03/2009)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	17.8	16.8	18.6	19.6	16.2	13.4	10.2	16.6	17.2	17.8	16.4	-	15.9
	Min	0.0	6.0	9.0	5.0	10.6	9.0	6.0	2.4	2.4	9.0	5.9	-	4.9
Relative Humidity	Max	97	98	98	98	99	99	99	99	99	98	98	-	-
	Min	21	42	57	33	65	64	94	48	54	13	49	-	-
Soil Temperature at 10 cm	06 UTC	7.0	8.4	10.2	9.8	11.0	11.2	9.8	9.0	8.6	10.4	9.6	-	8.6
	12 UTC	8.0	9.8	11.2	11.2	12.0	11.2	9.8	10.4	9.8	11.0	10.4	-	11.1
Sunshine Duration		7.0	1.1	-	7.6	1.0	0.2	0.0	8.5	9.4	10.2	5.0	-	5.6
Precipitation				15.8		32.5	19.8	30.9				99.0	-	27.5
Evaporation		1.9	0.5	0.6	1.0	0.6	1.8	0.5	2.0	3.4	3.5	15.8	-	-
Growing Degrees	5	3.9	6.4	8.8	7.3	8.4	6.2	3.1	4.5	4.8	8.4	61.8	-	54.2
	10	0.0	1.4	3.8	2.3	3.4	1.2	0.0	0.0	0.0	3.4	15.5	-	12.8

1st 10-day period (1-10/03/2009)	Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	16.4	-
Precipitation - Reference Evapotranspiration	82.6	-
Number of Rainy Days	4.0	-
Number of Dry Days	8.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

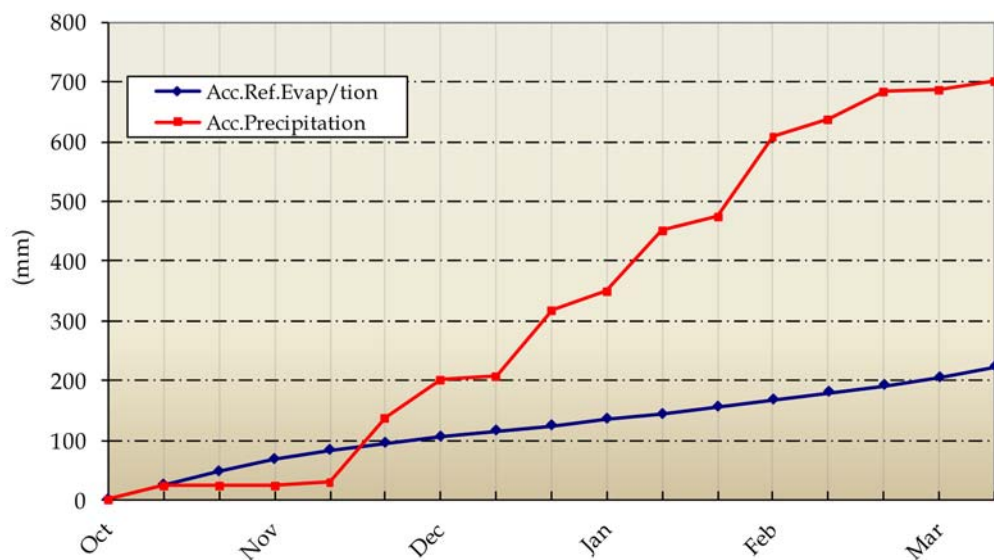


Kalamata

1st 10-day period (1-10/03/2009)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	16.2	17.0	17.4	17.0	-	16.8	12.8	14.4	18.0	15.8	16.2	-	16.0
	Min	1.4	5.6	4.8	5.0	12.0	11.6	9.6	7.2	5.0	9.2	7.1	-	5.6
Relative Humidity	Max	92	97	97	97	93	87	94	97	94	92	94	-	-
	Min	39	56	58	65	62	53	68	65	43	28	54	-	-
Soil Temperature at 10 cm	06 UTC	8.4	9.8	10.0	10.6	12.0	12.6	11.8	11.0	11.0	11.8	10.9	-	10.3
	12 UTC	9.6	11.0	11.4	11.6	-	12.8	-	12.2	12.0	12.6	11.6	-	12.1
Sunshine Duration		6.6	7.5	10.0	7.6	4.1	0.4	1.0	4.5	9.6	9.6	6.1	-	5.8
Precipitation						0.2	0.2	11.8	3.8		0.0	16.0	-	26.1
Evaporation		2.0	4.0	3.0	1.2	1.0	2.8	1.2	2.0	3.0	3.0	23.2	-	29.9
Growing Degrees	5	3.8	6.3	6.1	6.0	-	9.2	6.2	5.8	6.5	7.5	-	-	58.2
	10	0.0	1.3	1.1	1.0	-	4.2	1.2	0.8	1.5	2.5	-	-	14.6

1st 10-day period (1-10/03/2009)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	18.5	-	18.8
Precipitation - Reference Evapotranspiration	-2.5	-	7.3
Number of Rainy Days	4.0	-	3.2
Number of Dry Days	10.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

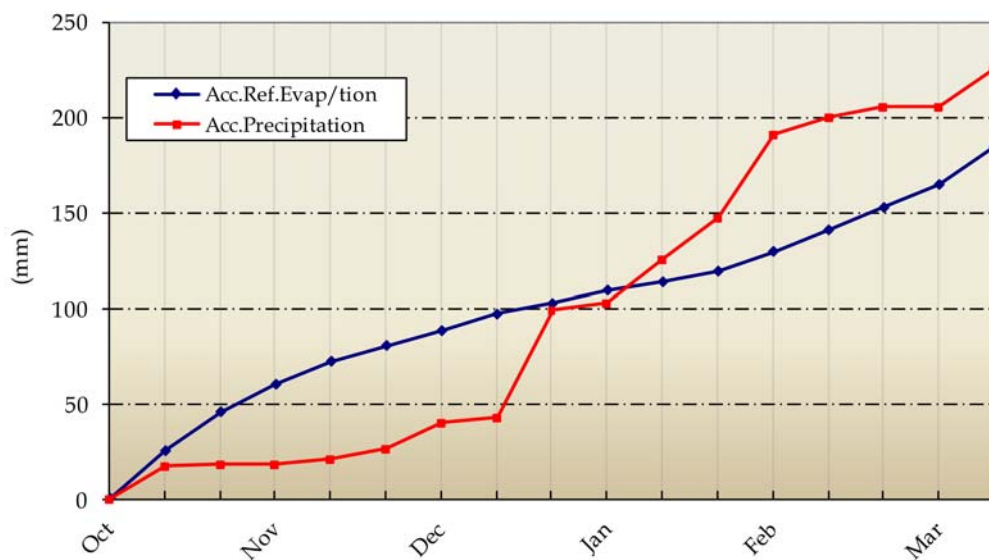


Larisa

1st 10-day period (1-10/03/2009)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	16.8	19.6	19.6	15.6	18.6	14.8	14.0	15.6	18.2	14.4	16.7	-	13.6
	Min	-2.4	4.0	3.4	7.6	10.6	4.6	2.4	4.4	1.0	1.7	3.7	-	2.4
Relative Humidity	Max	86	89	94	95	93	94	97	97	97	82	92	-	-
	Min	33	33	43	68	49	65	55	55	35	29	46	-	-
Soil Temperature at 10 cm	06 UTC	6.4	7.4	8.4	10.0	10.6	10.2	9.4	9.4	8.8	9.6	9.0	-	7.8
	12 UTC	7.0	8.4	9.6	10.8	11.0	10.6	10.2	10.2	10.2	8.0	9.6	-	8.9
Sunshine Duration		6.1	3.1	6.4	2.2	4.4	1.9	5.0	5.6	8.8	8.8	5.2	-	4.9
Precipitation				0.0		5.2	10.9	0.7	2.4		0.6	19.8	-	10.9
Evaporation		0.0	1.0	8.5	2.0	1.9	1.9	1.2	1.0	10.1	5.9	33.5	-	18.9
Growing Degrees	5	2.2	6.8	6.5	6.6	9.6	4.7	3.2	5.0	4.6	3.1	52.3	-	34.4
	10	0.0	1.8	1.5	1.6	4.6	0.0	0.0	0.0	0.0	0.0	9.5	-	4.1

1st 10-day period (1-10/03/2009)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	19.9	-	17.1
Precipitation - Reference Evapotranspiration	-0.1	-	-6.2
Number of Rainy Days	5.0	-	3.2
Number of Dry Days	13.0	-	-

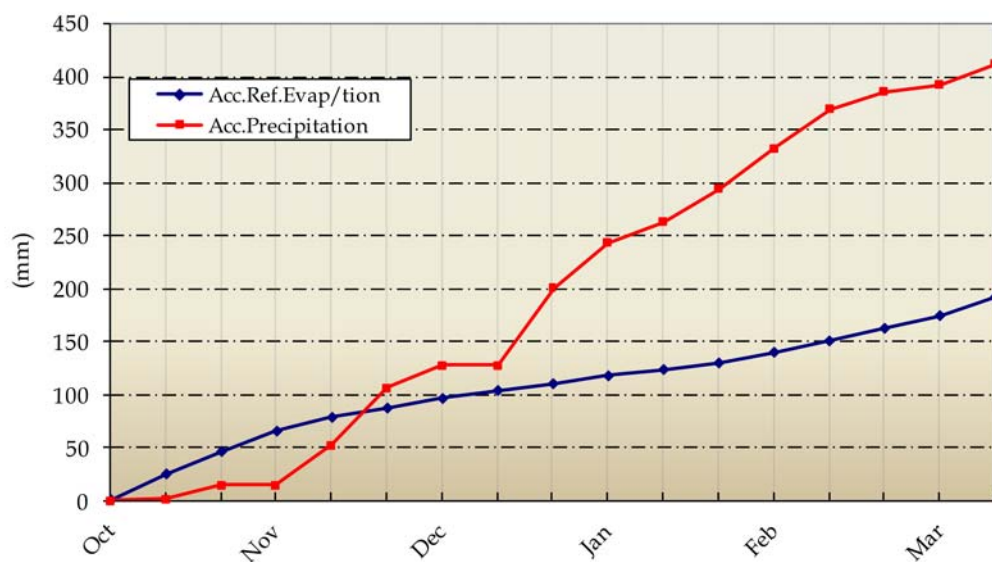
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



1st 10-day period (1-10/03/2009)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	17.6	18.2	21.4	18.2	20.0	18.4	16.6	17.2	20.4	20.4	18.8	-	15.8
	Min	-2.0	5.0	4.1	1.2	12.0	9.2	6.4	2.8	1.6	4.8	4.5	-	3.4
Relative Humidity	Max	92	94	95	93	95	89	95	94	93	64	90	-	-
	Min	37	46	37	56	45	63	41	52	34	21	43	-	-
Soil Temperature at 10 cm	06 UTC	4.6	8.0	7.4	8.0	8.0	11.0	10.8	9.4	7.8	8.4	8.3	-	8.0
	12 UTC	10.0	12.4	13.2	13.2	13.8	14.2	12.8	13.4	13.8	13.8	13.1	-	12.9
Sunshine Duration		7.3	3.7	9.4	6.4	4.1	0.0	5.6	5.3	9.2	9.0	6.0	-	5.1
Precipitation						11.8	2.8	2.3	2.5			19.4	-	17.8
Evaporation		3.0	4.0	2.2	1.6	2.0	0.1	2.4	2.6	3.0	2.8	23.7	-	20.9
Growing Degrees	5	2.8	6.6	7.8	4.7	11.0	8.8	6.5	5.0	6.0	7.6	66.8	-	47.5
	10	0.0	1.6	2.8	0.0	6.0	3.8	1.5	0.0	1.0	2.6	19.3	-	8.2

1st 10-day period (1-10/03/2009)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	17.3	-	16.8
Precipitation - Reference Evapotranspiration	2.1	-	1.0
Number of Rainy Days	4.0	-	3.1
Number of Dry Days	4.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

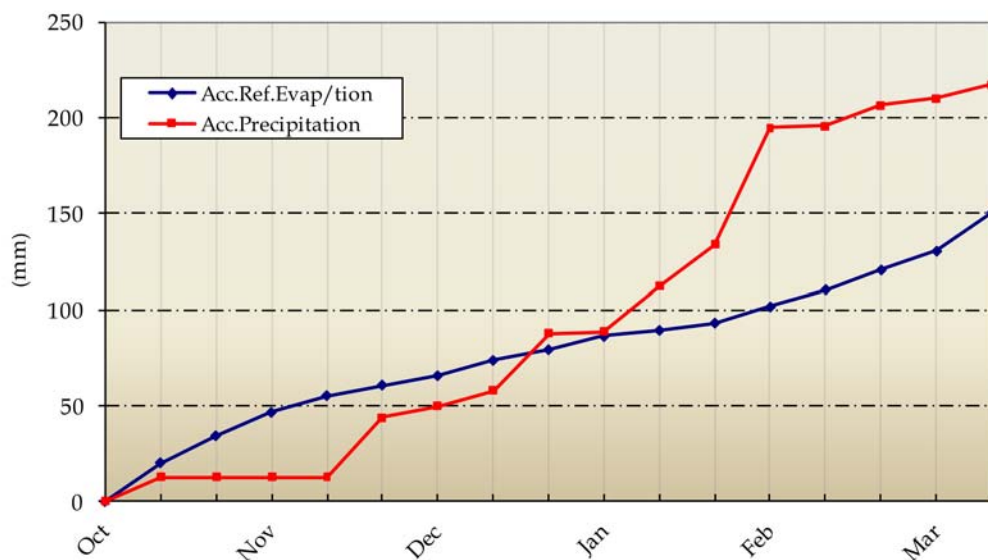


1st 10-day period (1-10/03/2009)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	16.2	16.6	16.4	14.4	15.6	18.2	18.2	18.0	17.8	14.0	16.5	-	13.1
	Min	0.8	3.6	6.2	6.0	9.0	9.6	9.0	5.0	3.4	6.0	5.9	-	2.6
Relative Humidity	Max	70	85	89	84	83	87	79	83	69	86	82	-	-
	Min	33	50	53	64	75	45	41	30	28	31	45	-	-
Soil Temperature at 10 cm	06 UTC	-	7.2	8.6	9.4	9.8	10.4	10.2	9.6	9.0	9.6	9.3	-	6.6
	12 UTC	6.6	8.0	9.0	9.4	9.8	10.8	10.8	10.6	10.0	10.0	9.5	-	8.2
Sunshine Duration		8.3	3.2	4.9	0.9	0.8	4.6	8.8	9.6	9.1	8.7	5.9	-	4.9
Precipitation						3.5	3.8				0.0	7.3	-	8.6
Evaporation		0.4	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.3	0.2	2.2	-	12.9
Growing Degrees	5	3.5	5.1	6.3	5.2	7.3	8.9	8.6	6.5	5.6	5.0	62.0	-	33.1
	10	0.0	0.1	1.3	0.2	2.3	3.9	3.6	1.5	0.6	0.0	13.5	-	4.4

Series

1st 10-day period (1-10/03/2009)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	20.3	-	14.1
Precipitation - Reference Evapotranspiration	-13.0	-	-5.5
Number of Rainy Days	2.0	-	2.7
Number of Dry Days	10.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



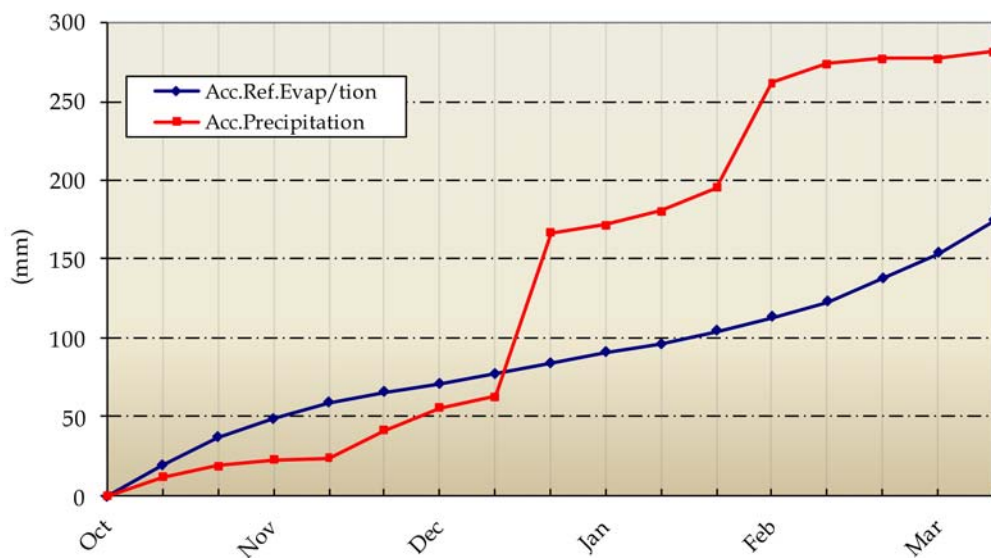


Trikala Imathias

1st 10-day period (1-10/03/2009)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	18.6	18.4	18.6	16.2	17.4	17.0	15.4	-	16.6	14.4	17.0	-	13.2
	Min	0.6	6.4	7.4	10.4	10.6	8.4	5.8	-	1.0	6.6	6.4	-	3.0
Relative Humidity	Max	88	85	96	92	94	95	-	91	92	95	92	-	-
	Min	29	37	45	66	70	65	-	30	33	20	44	-	-
Soil Temperature at 10 cm	06 UTC	7.0	8.6	9.6	11.0	11.2	10.2	6.8	-	8.6	9.6	9.2	-	7.7
	12 UTC	8.8	10.6	11.8	11.2	11.8	12.0	12.2	-	11.2	11.2	11.2	-	8.2
Sunshine Duration		8.6	3.8	8.4	0.6	2.7	3.5	-	7.7	9.9	8.8	6.0	-	4.7
Precipitation						1.2	3.5					4.7	-	18.0
Evaporation		0.3	1.0	1.5	1.1	1.0	0.1	-	-	0.1	4.0	-	-	14.5
Growing Degrees	5	4.6	7.4	8.0	8.3	9.0	7.7	5.6	-	3.8	5.5	-	-	36.2
	10	0.0	2.4	3.0	3.3	4.0	2.7	0.6	-	0.0	0.5	-	-	5.5

1st 10-day period (1-10/03/2009)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	20.6	-	15.4
Precipitation - Reference Evapotranspiration	-15.9	-	2.6
Number of Rainy Days	2.0	-	3.0
Number of Dry Days	13.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

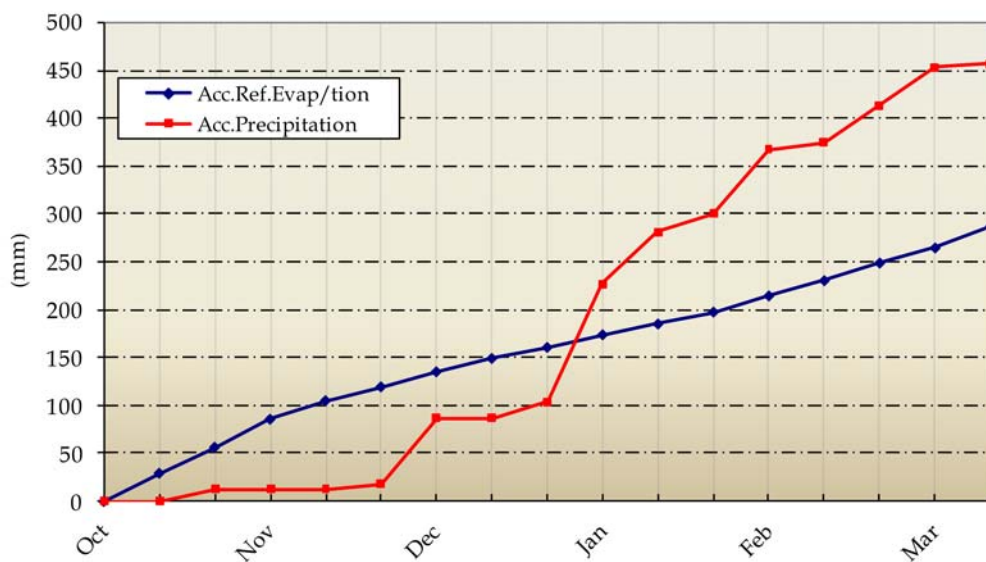


Tympaki

1st 10-day period (1-10/03/2009)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	16.2	16.4	18.2	20.0	20.0	20.6	18.8	16.0	18.0	17.2	18.1	-	16.5
	Min	4.2	7.4	7.4	7.6	12.0	11.0	9.0	9.0	7.4	14.2	8.9	-	7.4
Relative Humidity	Max	91	95	96	94	94	94	92	97	81	90	92	-	-
	Min	27	57	49	40	29	34	40	63	48	47	43	-	-
Soil Temperature at 10 cm	06 UTC	8.4	10.6	11.6	12.0	14.4	13.6	14.6	13.0	12.0	13.8	12.4	-	12.5
	12 UTC	12.8	14.4	16.4	16.6	15.2	17.2	17.2	15.4	16.0	16.2	15.7	-	15.2
Sunshine Duration		8.3	8.1	8.8	7.4	0.0	0.0	0.1	3.7	9.3	4.5	5.0	-	6.1
Precipitation								0.8	3.0			3.8	-	16.7
Evaporation		3.0	3.0	4.0	3.0	1.0	3.0	3.8	1.0	5.0	5.0	31.8	-	35.1
Growing Degrees	5	5.2	6.9	7.8	8.8	11.0	10.8	8.9	7.5	7.7	10.7	85.3	-	69.0
	10	0.2	1.9	2.8	3.8	6.0	5.8	3.9	2.5	2.7	5.7	35.3	-	21.8

1st 10-day period (1-10/03/2009)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	22.4	-	21.5
Precipitation - Reference Evapotranspiration	-18.6	-	-4.8
Number of Rainy Days	2.0	-	2.7
Number of Dry Days	9.0	-	-

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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