



# AGROMETEOROLOGICAL BULLETIN

*April 2009*  
*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



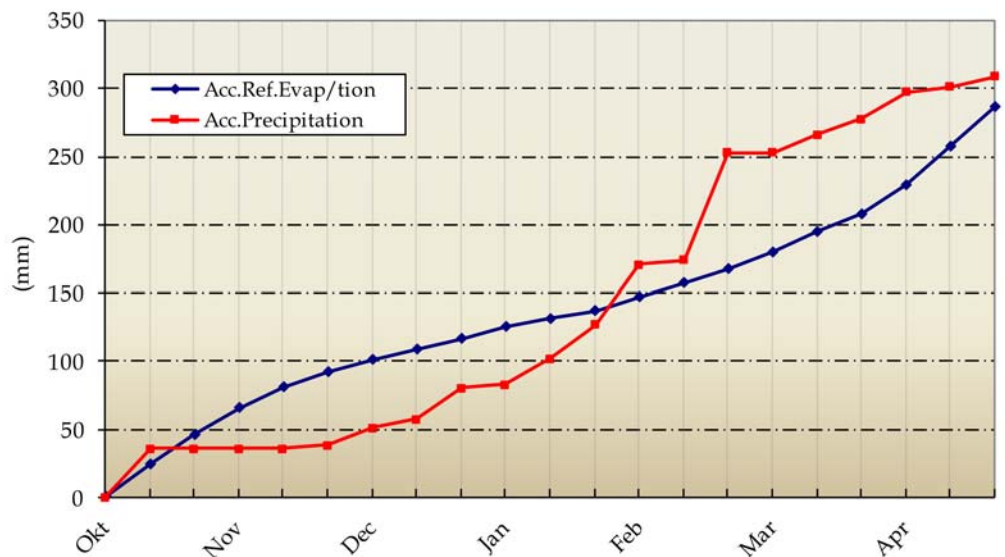
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2nd 10-day period (11-20/04/2009)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	20.8	17.0	15.2	16.8	14.4	17.2	20.0	19.0	19.0	24.4	18.4	-	16.6
	Min	6.4	9.6	7.4	10.8	9.0	5.6	7.0	8.8	8.4	9.0	8.2	-	7.0
Relative Humidity	Max	79	77	89	97	95	94	91	82	92	85	88	-	-
	Min	28	38	60	69	67	60	43	42	63	36	51	-	-
Soil Temperature at 10 cm	06 UTC	13.6	13.4	12.8	13.6	13.5	12.0	13.0	14.2	15.0	14.6	13.6	-	11.5
	12 UTC	16.4	16.2	15.2	16.2	15.0	16.2	17.2	18.2	17.2	18.6	16.6	-	14.7
Sunshine Duration		9.6	10.0	5.1	1.0	1.5	11.9	10.9	11.6	0.9	7.4	7.0	-	5.9
Precipitation					0.1	8.1						8.2	-	15.2
Evaporation		7.0	6.5	4.6	11.1	0.7	3.5	4.8	4.7	2.0	4.2	49.1	-	38.8
Growing Degrees	5	8.6	8.3	6.3	8.8	6.7	6.4	8.5	8.9	8.7	11.7	82.9	-	67.9
	10	3.6	3.3	1.3	3.8	1.7	1.4	3.5	3.9	3.7	6.7	32.9	-	22.8

2nd 10-day period (11-20/04/2009)	Previous Year Value	Past Years Mean Value	
Reference Evapotranspiration	29.2	-	26.7
Precipitation - Reference Evapotranspiration	-21.0	-	-11.5
Number of Rainy Days	2.0	-	2.8
Number of Dry Days	6.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

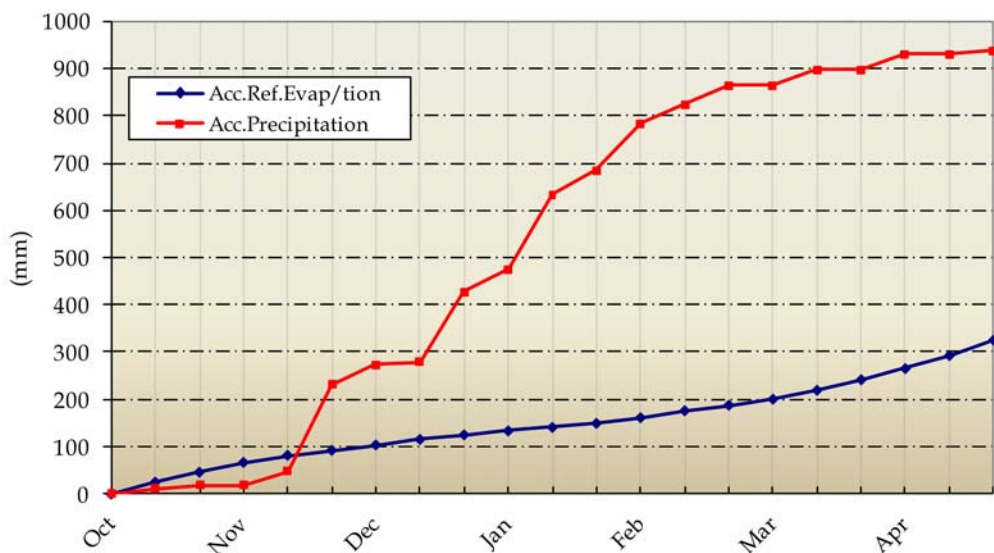


Andravida

2nd 10-day period (11-20/04/2009)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	18.2	24.6	19.2	17.8	17.2	19.0	19.4	22.0	24.8	24.0	20.6	-	18.4
	Min	9.6	7.2	12.6	13.2	12.8	8.2	8.0	8.6	10.8	12.2	10.3	-	9.1
Relative Humidity	Max	92	94	95	95	95	97	95	97	90	81	93	-	-
	Min	49	34	46	64	69	55	56	51	25	31	48	-	-
Soil Temperature at 10 cm	06 UTC	15.8	15.6	16.0	15.8	15.0	15.2	16.0	16.0	16.0	17.0	15.8	-	13.7
	12 UTC	19.6	19.4	18.2	17.8	19.4	20.4	20.6	20.6	21.0	21.6	19.9	-	16.7
Sunshine Duration		2.2	7.5	10.0	5.8	11.1	11.4	8.8	10.8	5.3	8.8	8.2	-	7.2
Precipitation					6.4							6.4	-	25.7
Evaporation		2.0	1.0	3.0	2.4	1.0	1.0	4.0	1.0	3.0	0.0	18.4	-	37.7
Growing Degrees	5	8.9	10.9	10.9	10.5	10.0	8.6	8.7	10.3	12.8	13.1	104.7	-	87.1
	10	3.9	5.9	5.9	5.5	5.0	3.6	3.7	5.3	7.8	8.1	54.7	-	37.4

2nd 10-day period (11-20/04/2009)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	32.6	-	28.0
Precipitation - Reference Evapotranspiration	-26.2	-	-2.3
Number of Rainy Days	1.0	-	3.3
Number of Dry Days	17.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

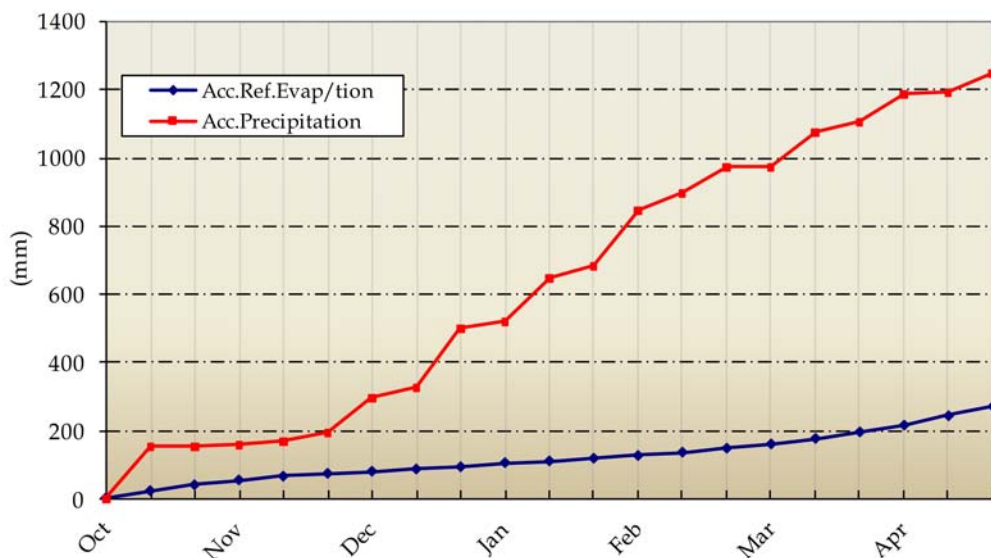


Arta

2nd 10-day period (11-20/04/2009)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	-	25.4	19.4	15.8	20.2	22.0	21.8	24.2	-	26.2	21.9	-	19.1
	Min	13.0	7.6	12.2	12.0	8.8	7.6	8.6	8.6	11.2	13.6	10.3	-	8.1
Relative Humidity	Max	94	94	99	99	97	98	97	97	91	92	96	-	-
	Min	16	16	31	81	53	35	33	20	22	18	32	-	-
Soil Temperature at 10 cm	06 UTC	14.4	14.4	16.0	14.2	13.8	14.4	15.0	14.2	16.0	17.0	14.9	-	13.5
	12 UTC	16.2	16.2	15.6	14.4	15.6	16.2	17.0	17.0	19.0	18.6	16.6	-	17.0
Sunshine Duration		6.9	3.2	1.7	0.3	7.8	10.6	10.7	9.7	5.8	6.6	6.3	-	6.2
Precipitation				5.2	49.7	1.3						56.2	-	37.4
Evaporation		4.2	6.7	8.7	0.5	4.8	2.0	3.9	0.0	3.5	1.9	36.2	-	-
Growing Degrees	5	-	11.5	10.8	8.9	9.5	9.8	10.2	11.4	-	14.9	-	-	85.4
	10	-	6.5	5.8	3.9	4.5	4.8	5.2	6.4	-	9.9	-	-	36.5

2nd 10-day period (11-20/04/2009)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	27.7	-	26.7
Precipitation - Reference Evapotranspiration	28.5	-	10.7
Number of Rainy Days	3.0	-	3.7
Number of Dry Days	4.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

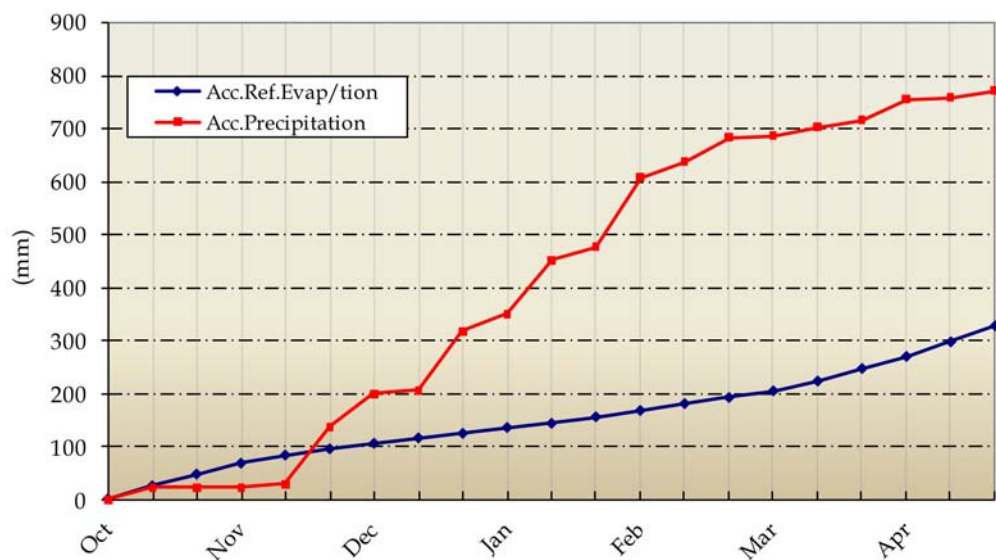


Kalamata

2nd 10-day period (11-20/04/2009)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	18.4	24.0	19.6	17.0	19.0	19.0	21.2	20.8	24.0	22.6	20.6	-	19.2
	Min	10.8	10.0	12.0	13.4	11.6	7.4	7.0	8.0	9.2	9.2	9.9	-	8.4
Relative Humidity	Max	92	83	89	95	100	95	95	95	87	89	92	-	-
	Min	45	40	57	79	55	56	48	41	30	36	49	-	-
Soil Temperature at 10 cm	06 UTC	15.0	14.4	15.4	15.8	15.4	15.0	15.0	15.4	15.2	16.0	15.3	-	13.9
	12 UTC	15.6	15.8	16.6	15.6	15.4	16.6	16.8	16.6	16.0	17.4	16.2	-	16.9
Sunshine Duration		2.1	7.7	8.7	2.2	8.9	11.5	12.1	10.0	6.6	7.0	7.7	-	7.1
Precipitation		0.2		0.0	12.0	0.1						12.3	-	25.5
Evaporation		2.2	4.0	5.8	0.3	4.0	5.0	4.0	6.0	3.0	5.0	39.3	-	41.0
Growing Degrees	5	9.6	12.0	10.8	10.2	10.3	8.2	9.1	9.4	11.6	10.9	102.1	-	88.0
	10	4.6	7.0	5.8	5.2	5.3	3.2	4.1	4.4	6.6	5.9	52.1	-	38.2

2nd 10-day period (11-20/04/2009)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	30.3	-	28.5
Precipitation - Reference Evapotranspiration	-18.0	-	-3.0
Number of Rainy Days	3.0	-	4.1
Number of Dry Days	4.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

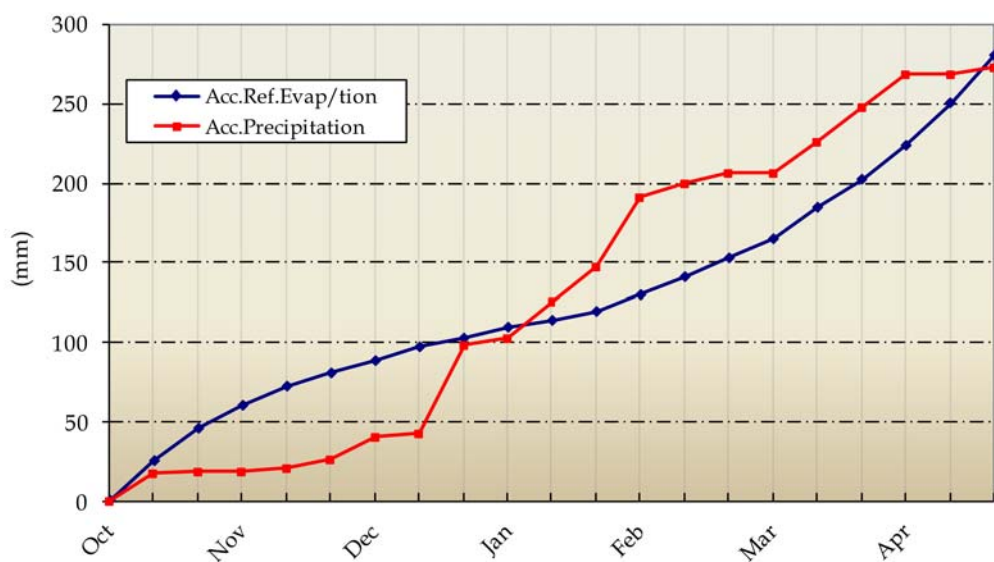


Larisa

2nd 10-day period (11-20/04/2009)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	18.2	17.6	14.4	15.4	18.8	22.4	25.4	23.4	24.0	21.4	20.1	-	19.0
	Min	6.0	5.2	7.4	9.4	8.0	4.8	5.0	9.4	9.4	12.6	7.7	-	6.4
Relative Humidity	Max	89	87	92	95	97	97	94	95	92	91	93	-	-
	Min	49	47	74	73	48	35	34	50	41	40	49	-	-
Soil Temperature at 10 cm	06 UTC	13.2	12.6	10.4	10.8	13.2	13.0	13.6	14.8	15.4	16.4	13.3	-	12.8
	12 UTC	14.4	14.2	13.6	15.0	16.0	16.2	16.8	17.6	17.6	16.6	15.8	-	14.4
Sunshine Duration		1.0	6.4	0.8	1.3	8.0	10.9	10.8	9.3	6.9	5.3	6.1	-	6.4
Precipitation				0.5	3.3	0.3						4.1	-	13.6
Evaporation		5.2	3.9	0.4	2.3	2.4	1.8	6.4	6.1	4.3	6.1	38.9	-	36.9
Growing Degrees	5	7.1	6.4	5.9	7.4	8.4	8.6	10.2	11.4	11.7	12.0	89.1	-	77.0
	10	2.1	1.4	0.9	2.4	3.4	3.6	5.2	6.4	6.7	7.0	39.1	-	28.8

2nd 10-day period (11-20/04/2009)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	30.1	-	28.6
Precipitation - Reference Evapotranspiration	-26.0	-	-15.0
Number of Rainy Days	3.0	-	3.4
Number of Dry Days	6.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

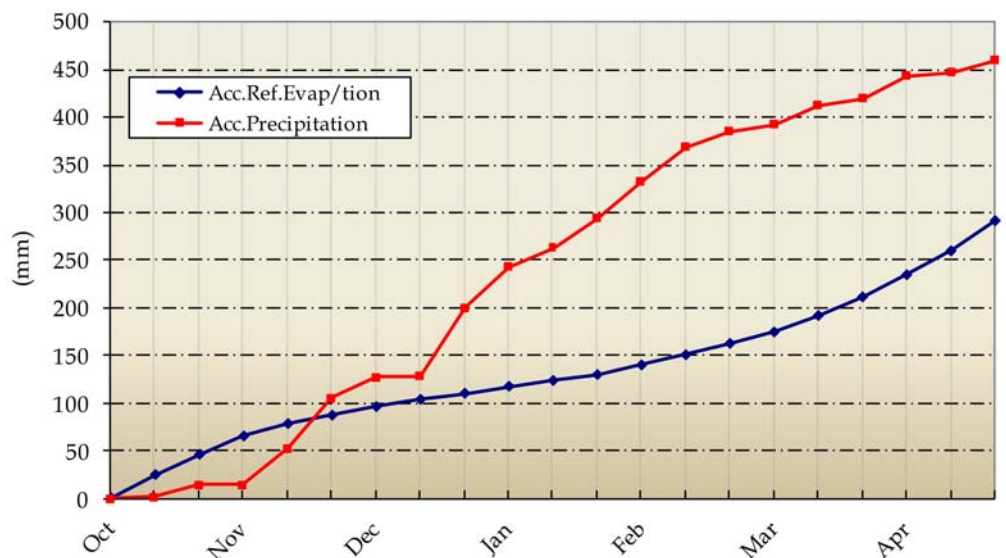


Pyrgela

2nd 10-day period (11-20/04/2009)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	19.0	22.2	18.6	21.6	22.8	23.0	23.8	-	24.2	23.8	22.1	-	20.8
	Min	9.2	5.4	8.8	11.6	-	5.6	6.6	7.2	8.2	8.2	7.9	-	6.6
Relative Humidity	Max	88	95	93	-	90	95	86	91	92	89	91	-	-
	Min	39	40	55	-	37	47	45	46	33	36	42	-	-
Soil Temperature at 10 cm	06 UTC	14.4	11.8	14.4	14.6	-	12.2	12.8	13.8	15.0	16.0	13.9	-	12.7
	12 UTC	17.6	18.4	19.6	16.4	-	19.6	20.6	21.8	22.2	22.0	19.8	-	19.7
Sunshine Duration		1.9	7.2	9.0	-	6.1	10.6	10.4	8.8	7.5	6.3	7.5	-	6.7
Precipitation		3.3	0.1		1.5	7.0						11.9	-	12.7
Evaporation		3.1	3.3	3.5	-	3.6	3.8	3.9	3.0	5.0	5.3	-	-	35.0
Growing Degrees	5	9.1	8.8	8.7	11.6	-	9.3	10.2	-	11.2	11.0	-	-	87.0
	10	4.1	3.8	3.7	6.6	-	4.3	5.2	-	6.2	6.0	-	-	38.0

2nd 10-day period (11-20/04/2009)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	31.7	-	28.0
Precipitation - Reference Evapotranspiration	-19.8	-	-15.3
Number of Rainy Days	4.0	-	3.4
Number of Dry Days	3.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

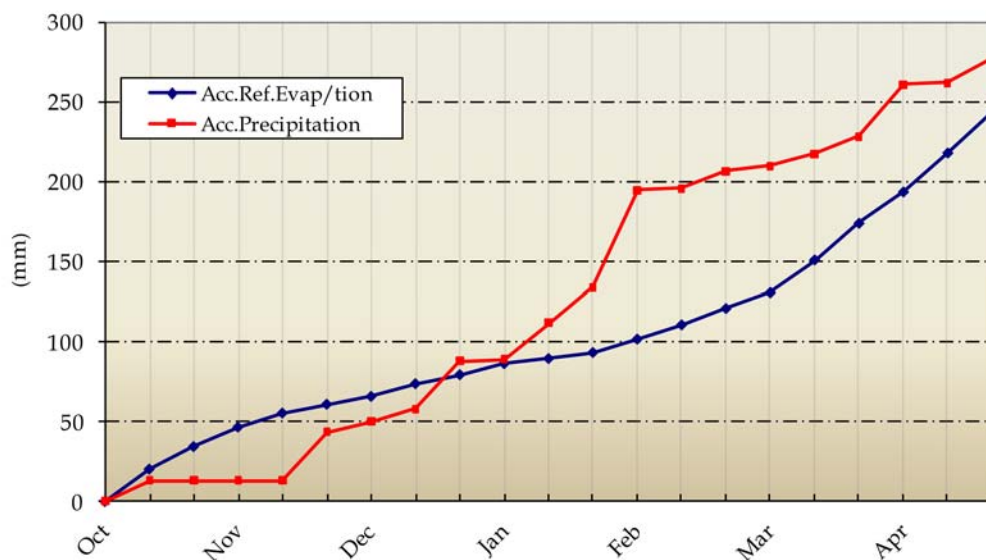


2nd 10-day period (11-20/04/2009)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	23.4	22.0	13.4	11.4	17.0	24.6	-	24.0	25.0	-	20.1	-	19.0
	Min	6.2	6.2	8.6	8.0	8.2	6.0	7.6	8.4	10.6	10.6	8.0	-	7.6
Relative Humidity	Max	66	69	85	97	93	97	87	81	88	88	85	-	-
	Min	29	30	55	90	59	33	47	44	41	54	48	-	-
Soil Temperature at 10 cm	06 UTC	12.6	13.0	13.4	12.8	12.8	12.4	13.0	13.0	15.0	15.6	13.4	-	12.3
	12 UTC	14.2	-	13.6	13.0	-	14.4	15.2	16.0	16.2	16.4	14.9	-	15.2
Sunshine Duration		9.4	9.3	0.8	0.0	4.5	9.5	10.4	9.7	6.3	3.3	6.3	-	5.9
Precipitation				0.0	10.8	4.9						15.7	-	15.0
Evaporation		4.0	3.0	0.6	0.4	0.0	2.9	4.0	3.1	3.9	3.8	25.7	-	31.1
Growing Degrees	5	9.8	9.1	6.0	4.7	7.6	10.3	-	11.2	12.8	-	-	-	82.9
	10	4.8	4.1	1.0	0.0	2.6	5.3	-	6.2	7.8	-	-	-	34.2

Series

2nd 10-day period (11-20/04/2009)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	25.7	-	25.7
Precipitation - Reference Evapotranspiration	-10.0	-	-10.7
Number of Rainy Days	2.0	-	3.4
Number of Dry Days	10.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



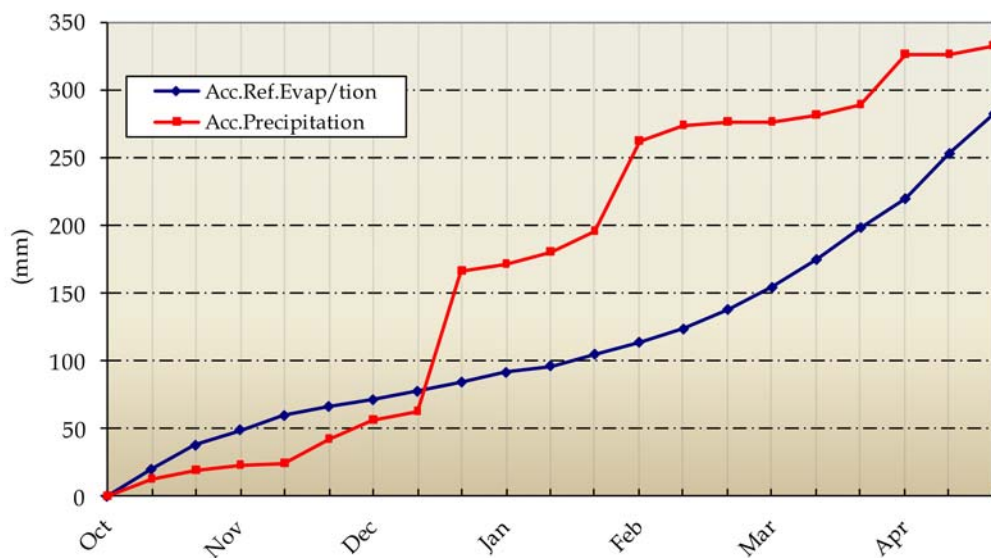


Trikala Imathias

2nd 10-day period (11-20/04/2009)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	22.0	19.4	13.4	14.0	20.4	24.8	-	25.8	-	25.2	20.6	-	19.3
	Min	7.6	8.0	9.0	9.4	10.2	9.4	-	8.8	-	13.0	9.4	-	8.0
Relative Humidity	Max	98	92	98	95	95	-	65	-	99	96	92	-	-
	Min	26	32	72	82	38	-	30	-	35	33	44	-	-
Soil Temperature at 10 cm	06 UTC	13.8	14.0	14.4	13.0	13.6	13.4	-	14.8	-	16.2	14.2	-	13.1
	12 UTC	17.4	17.0	14.8	13.2	15.6	17.4	-	18.8	-	18.4	16.6	-	14.0
Sunshine Duration		5.0	8.9	0.2	0.0	6.8	-	10.8	-	7.0	5.2	5.5	-	5.8
Precipitation					6.6							6.6	-	13.7
Evaporation		7.0	6.9	6.1	6.2	4.8	-	13.2	-	11.0	14.6	-	-	31.0
Growing Degrees	5	9.8	8.7	6.2	6.7	10.3	12.1	-	12.3	-	14.1	-	-	85.7
	10	4.8	3.7	1.2	1.7	5.3	7.1	-	7.3	-	9.1	-	-	37.9

2nd 10-day period (11-20/04/2009)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	29.3	-	27.0
Precipitation - Reference Evapotranspiration	-22.7	-	-13.3
Number of Rainy Days	1.0	-	3.0
Number of Dry Days	22.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

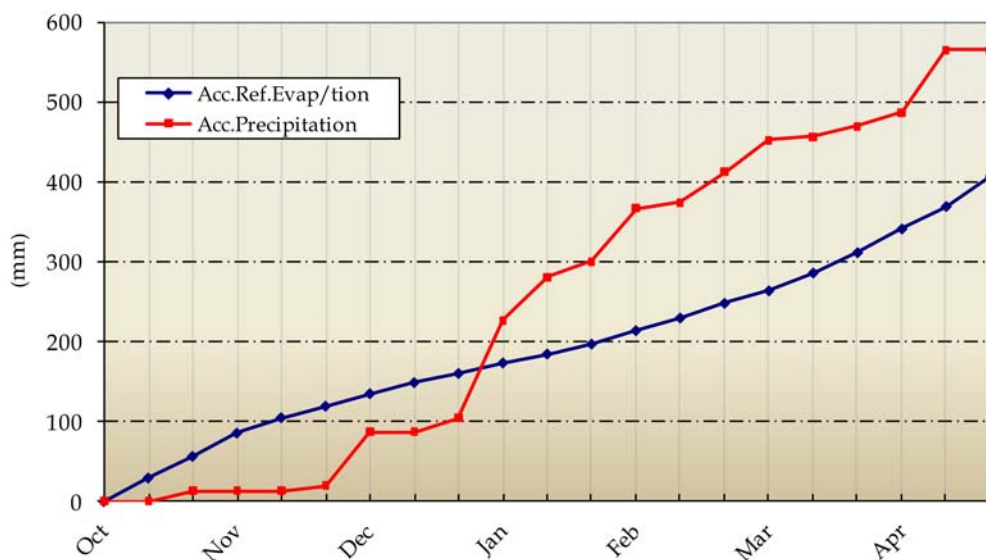


Tympaki

2nd 10-day period (11-20/04/2009)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	21.6	24.4	23.0	18.8	21.0	22.0	20.8	22.8	25.6	24.2	22.4	-	20.2
	Min	11.6	13.4	10.8	8.4	14.0	10.8	15.6	7.6	10.0	9.4	11.2	-	10.4
Relative Humidity	Max	95	84	97	93	90	85	92	95	91	56	88	-	-
	Min	29	33	29	65	38	29	33	30	24	17	33	-	-
Soil Temperature at 10 cm	06 UTC	16.6	16.0	17.0	17.2	18.2	18.0	17.2	17.8	18.8	19.0	17.6	-	17.9
	12 UTC	19.4	21.8	22.8	22.0	22.4	23.4	24.0	25.6	24.4	25.8	23.2	-	22.0
Sunshine Duration		1.8	6.9	8.5	8.0	10.2	11.1	11.4	11.4	7.2	9.3	8.6	-	7.9
Precipitation													-	8.6
Evaporation		3.0	5.0	6.0	4.0	5.0	8.0	6.0	5.0	6.0	7.0	55.0	-	48.6
Growing Degrees	5	11.6	13.9	11.9	8.6	12.5	11.4	13.2	10.2	12.8	11.8	117.9	-	102.2
	10	6.6	8.9	6.9	3.6	7.5	6.4	8.2	5.2	7.8	6.8	67.9	-	52.5

2nd 10-day period (11-20/04/2009)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	38.0	-	32.4
Precipitation - Reference Evapotranspiration	-38.0	-	-23.8
Number of Rainy Days	0.0	-	1.8
Number of Dry Days	13.0	-	-

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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