



# AGROMETEOROLOGICAL BULLETIN

*March 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



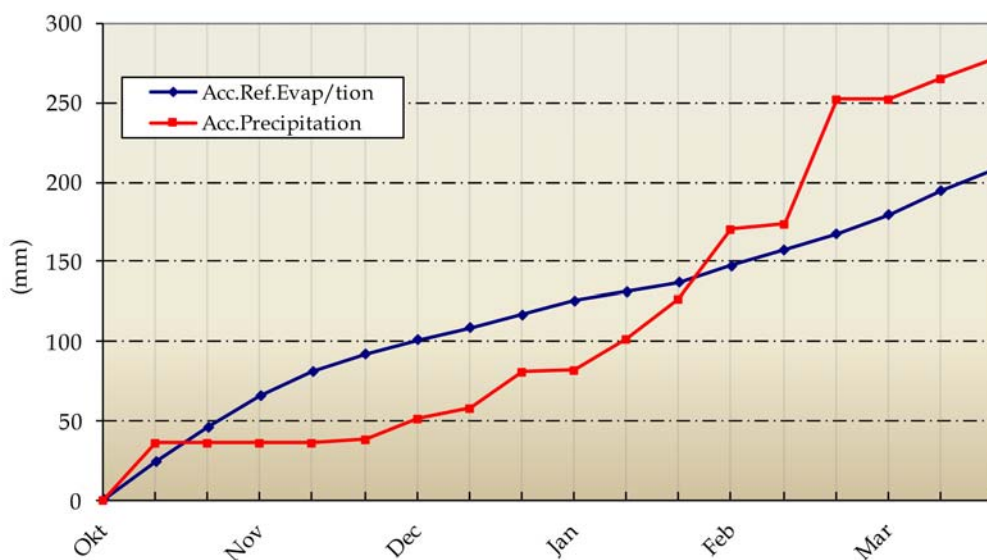
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2nd 10-day period (11-20/03/2009)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	11.2	8.2	11.2	10.2	12.2	13.4	9.4	9.2	8.8	10.2	10.4	-	11.6
	Min	0.0	3.0	3.8	3.6	-1.2	0.8	5.6	0.6	3.0	-1.8	1.7	-	2.9
Relative Humidity	Max	96	97	91	90	89	92	92	97	93	92	93	-	-
	Min	54	72	61	48	52	47	67	70	46	40	56	-	-
Soil Temperature at 10 cm	06 UTC	6.6	7.2	7.0	7.5	2.4	6.6	9.2	6.5	6.6	4.8	6.4	-	6.6
	12 UTC	8.8	8.0	10.2	9.6	9.6	10.4	9.4	8.2	8.6	8.6	9.1	-	8.9
Sunshine Duration		4.4	0.1	6.5	3.4	9.5	7.6	0.7	0.2	1.4	5.4	3.9	-	4.9
Precipitation			3.9	0.0	0.0			3.4	3.6	0.6		11.5	-	14.4
Evaporation		1.5	0.2	1.5	0.0	0.0	2.2	0.5	0.2	1.9	2.8	10.8	-	21.8
Growing Degrees	5	0.6	0.6	2.5	1.9	0.5	2.1	2.5	0.0	0.9	0.0	11.6	-	27.0
	10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	3.4

2nd 10-day period (11-20/03/2009)	Previous Year Value	Past Years Mean Value	
Reference Evapotranspiration	13.0	-	18.1
Precipitation - Reference Evapotranspiration	-1.5	-	-3.7
Number of Rainy Days	4.0	-	2.2
Number of Dry Days	1.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



Andravida

2nd 10-day period (11-20/03/2009)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	-	13.8	14.0	14.2	15.4	15.4	16.0	15.2	13.2	14.8	14.7	-	15.7
	Min	3.2	-	4.6	4.2	4.0	4.8	5.4	5.8	1.8	3.6	4.2	-	6.3
Relative Humidity	Max	-	95	94	90	90	97	91	95	81	87	91	-	-
	Min	-	76	48	50	47	47	56	45	34	50	50	-	-
Soil Temperature at 10 cm	06 UTC	10.0	-	10.2	10.2	10.2	10.8	11.0	11.2	9.2	9.4	10.2	-	10.6
	12 UTC	-	-	12.8	13.0	13.8	14.6	15.2	15.4	13.2	13.0	13.9	-	12.8
Sunshine Duration		-	3.7	9.0	10.2	10.3	9.1	9.3	7.9	10.8	4.7	8.3	-	6.4
Precipitation													-	25.8
Evaporation		-	4.0	3.0	6.0	3.3	0.7	2.0	5.0	5.2	1.2	-	-	26.9
Growing Degrees	5	-	-	4.3	4.2	4.7	5.1	5.7	5.5	2.5	4.2	-	-	60.4
	10	-	-	0.0	0.0	0.0	0.1	0.7	0.5	0.0	0.0	-	-	15.6

2nd 10-day period (11-20/03/2009)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	22.3	-	21.0
Precipitation - Reference Evapotranspiration	-22.3	-	4.8
Number of Rainy Days	0.0	-	3.7
Number of Dry Days	10.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

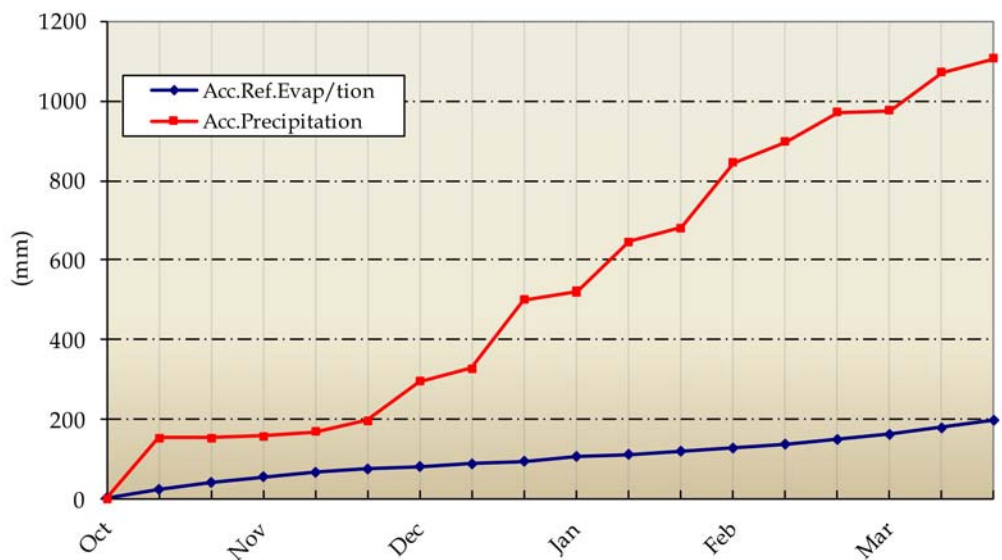


Arta

2nd 10-day period (11-20/03/2009)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	12.4	15.4	16.0	17.6	17.8	18.4	17.4	16.6	17.2	-	16.5	-	16.4
	Min	2.0	6.6	0.8	1.4	1.4	2.8	3.2	4.0	-1.4	4.2	2.5	-	5.3
Relative Humidity	Max	97	98	98	97	98	98	97	89	96	99	97	-	-
	Min	53	30	20	12	22	28	22	23	16	30	26	-	-
Soil Temperature at 10 cm	06 UTC	9.6	9.0	8.6	-	8.8	8.8	9.2	10.2	-	9.8	9.2	-	9.6
	12 UTC	10.2	10.4	9.4	10.2	10.0	10.4	10.6	11.8	11.2	11.2	10.5	-	12.1
Sunshine Duration		0.8	2.0	8.3	9.7	10.1	8.5	6.2	7.7	9.9	2.2	6.5	-	5.8
Precipitation		5.7	25.5					1.4			0.8	33.4	-	25.8
Evaporation		0.5	1.5	-	3.5	2.4	1.9	3.9	-	-	3.0	-	-	-
Growing Degrees	5	2.2	6.0	3.4	4.5	4.6	5.6	5.3	5.3	2.9	-	-	-	58.5
	10	0.0	1.0	0.0	0.0	0.0	0.6	0.3	0.3	0.0	-	-	-	14.9

2nd 10-day period (11-20/03/2009)	Previous Year Value	Past Years Mean Value	
Reference Evapotranspiration	19.2	-	18.9
Precipitation - Reference Evapotranspiration	14.2	-	6.9
Number of Rainy Days	4.0	-	3.4
Number of Dry Days	3.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

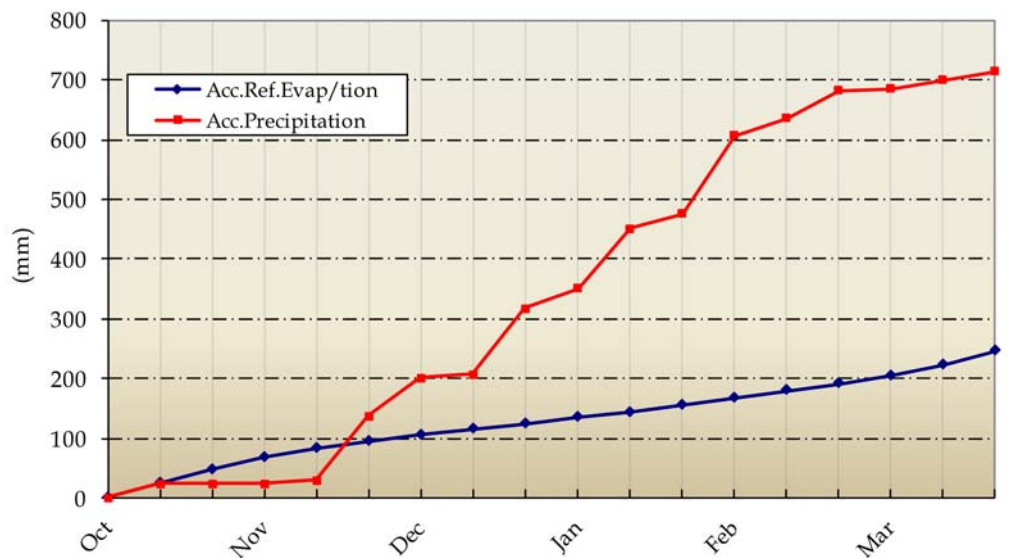


Kalamata

2nd 10-day period (11-20/03/2009)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	16.2	14.8	15.6	18.0	15.8	16.6	16.8	15.2	15.4	15.0	15.9	-	16.3
	Min	2.4	9.8	5.4	4.0	2.8	4.2	5.2	5.4	2.0	2.0	4.3	-	5.8
Relative Humidity	Max	95	97	97	90	94	94	97	97	82	93	94	-	-
	Min	33	62	34	30	52	45	45	29	19	45	39	-	-
Soil Temperature at 10 cm	06 UTC	10.0	12.0	11.2	-	-	10.8	11.2	11.6	10.6	10.2	11.0	-	10.9
	12 UTC	12.2	12.4	12.2	11.8	12.0	12.4	13.0	13.2	11.6	11.2	12.2	-	13.0
Sunshine Duration		9.8	3.7	10.0	10.3	8.3	10.1	9.9	5.1	10.8	9.9	8.8	-	6.1
Precipitation			13.3									13.3	-	22.7
Evaporation		8.0	2.7	4.0	3.8	4.0	4.0	3.0	3.0	3.0	6.5	42.0	-	33.5
Growing Degrees	5	4.3	7.3	5.5	6.0	4.3	5.4	6.0	5.3	3.7	3.5	51.3	-	60.5
	10	0.0	2.3	0.5	1.0	0.0	0.4	1.0	0.3	0.0	0.0	5.5	-	15.1

2nd 10-day period (11-20/03/2009)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	23.7	-	21.7
Precipitation - Reference Evapotranspiration	-10.4	-	1.0
Number of Rainy Days	1.0	-	3.8
Number of Dry Days	3.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



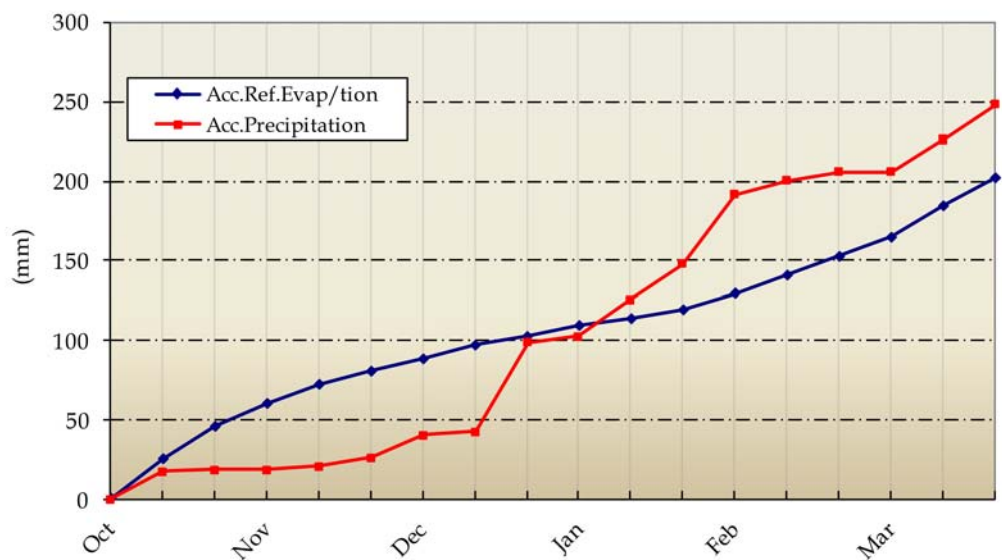


Larisa

2nd 10-day period (11-20/03/2009)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	11.2	9.0	14.0	14.6	14.8	17.2	12.4	13.6	11.8	13.2	13.2	-	14.0
	Min	-0.2	6.0	1.4	3.0	-0.4	0.0	7.8	2.6	0.4	0.4	2.1	-	2.8
Relative Humidity	Max	94	97	97	87	88	96	89	97	89	92	93	-	-
	Min	54	73	44	33	39	43	63	44	30	45	47	-	-
Soil Temperature at 10 cm	06 UTC	8.2	9.2	8.6	8.4	8.0	7.8	10.0	9.2	8.4	6.6	8.4	-	8.4
	12 UTC	9.0	9.0	9.2	9.4	9.4	9.2	10.2	10.2	8.8	8.4	9.3	-	9.5
Sunshine Duration		0.1	0.0	6.1	7.0	8.8	6.8	0.0	5.1	9.5	3.1	4.6	-	5.1
Precipitation		0.1	13.9						8.3			22.3	-	13.9
Evaporation		0.0	0.7	3.1	2.1	2.4	1.1	3.5	0.0	0.0	2.6	15.5	-	20.7
Growing Degrees	5	0.5	2.5	2.7	3.8	2.2	3.6	5.1	3.1	1.1	1.8	26.4	-	36.4
	10	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	-	5.5

2nd 10-day period (11-20/03/2009)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	17.7	-	18.5
Precipitation - Reference Evapotranspiration	4.6	-	-4.6
Number of Rainy Days	3.0	-	3.1
Number of Dry Days	0.0	-	-

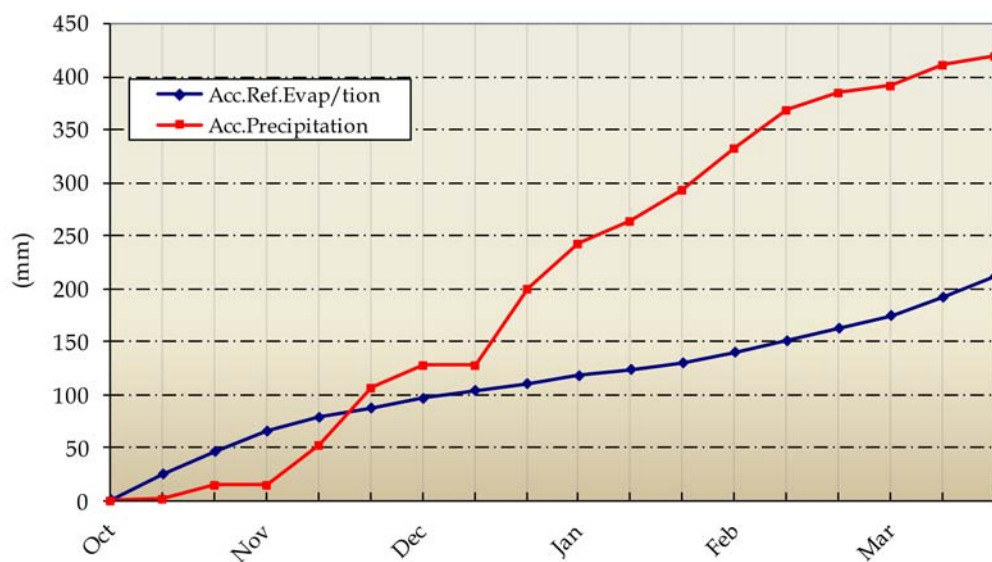
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



2nd 10-day period (11-20/03/2009)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	16.8	13.0	17.0	19.0	15.0	17.8	18.4	14.6	16.0	15.0	16.3	-	16.1
	Min	0.4	6.4	4.0	0.0	0.8	2.4	2.8	8.2	-0.6	-0.8	2.4	-	3.8
Relative Humidity	Max	93	92	94	89	93	94	94	92	92	85	92	-	-
	Min	42	81	43	30	46	42	49	64	27	35	46	-	-
Soil Temperature at 10 cm	06 UTC	7.4	10.4	8.6	7.4	7.4	8.4	8.6	10.4	7.6	7.4	8.4	-	8.5
	12 UTC	11.8	-	13.4	13.4	12.8	14.4	14.0	14.4	14.4	12.4	13.4	-	13.8
Sunshine Duration		8.9	0.0	9.5	10.3	9.7	7.1	5.4	5.3	10.1	8.0	7.4	-	5.3
Precipitation			3.8	2.9				0.9	0.2			7.8	-	19.4
Evaporation		3.6	0.2	2.3	2.6	2.6	3.0	1.2	2.0	3.5	2.6	23.6	-	22.9
Growing Degrees	5	3.6	4.7	5.5	4.5	2.9	5.1	5.6	6.4	2.7	2.1	43.1	-	49.6
	10	0.0	0.0	0.5	0.0	0.0	0.1	0.6	1.4	0.0	0.0	2.6	-	9.8

2nd 10-day period (11-20/03/2009)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	19.5	-	19.0
Precipitation - Reference Evapotranspiration	-11.7	-	0.4
Number of Rainy Days	4.0	-	3.5
Number of Dry Days	3.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

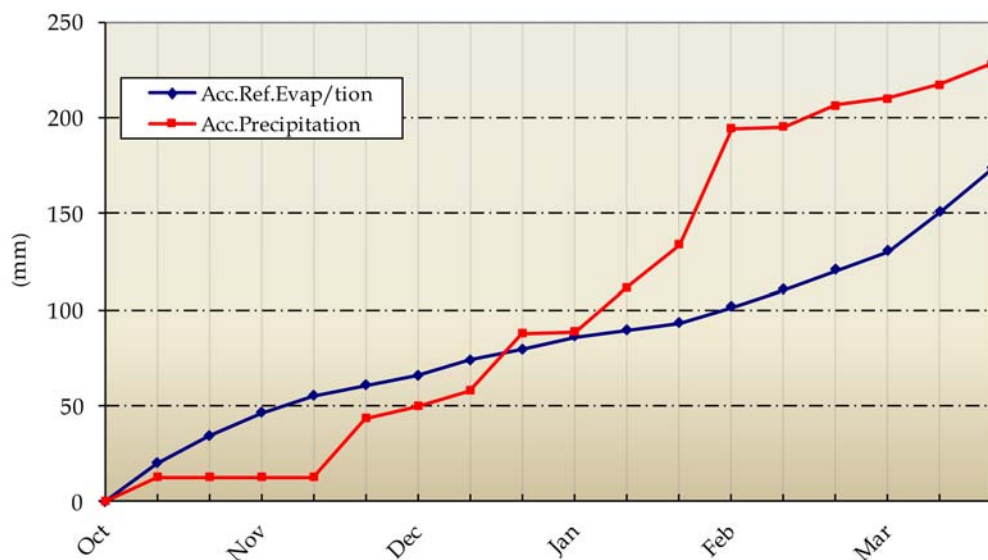


2nd 10-day period (11-20/03/2009)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	13.6	13.8	13.8	14.6	15.0	16.0	16.0	12.8	11.8	7.8	13.5	-	14.0
	Min	1.6	2.8	3.0	5.4	-0.4	4.0	3.0	4.0	4.2	-1.0	2.7	-	3.4
Relative Humidity	Max	66	82	66	46	47	81	70	67	39	96	66	-	-
	Min	41	36	27	25	20	35	26	37	23	73	34	-	-
Soil Temperature at 10 cm	06 UTC	8.4	9.2	8.8	8.6	8.0	8.4	8.8	9.0	8.6	7.8	8.6	-	7.7
	12 UTC	8.6	10.2	9.6	9.4	9.2	9.8	9.2	10.2	6.8	-	9.2	-	9.6
Sunshine Duration		3.7	3.5	8.3	9.1	9.8	6.1	4.8	7.3	10.3	0.0	6.3	-	4.7
Precipitation											11.1	11.1	-	10.9
Evaporation		0.2	0.3	0.4	0.6	0.3	0.5	1.2	1.4	2.0	1.6	8.5	-	16.6
Growing Degrees	5	2.6	3.3	3.4	5.0	2.3	5.0	4.5	3.4	3.0	0.0	32.5	-	38.5
	10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	7.3

Series

2nd 10-day period (11-20/03/2009)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	22.9	-	16.0
Precipitation - Reference Evapotranspiration	-11.8	-	-5.1
Number of Rainy Days	1.0	-	2.7
Number of Dry Days	13.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



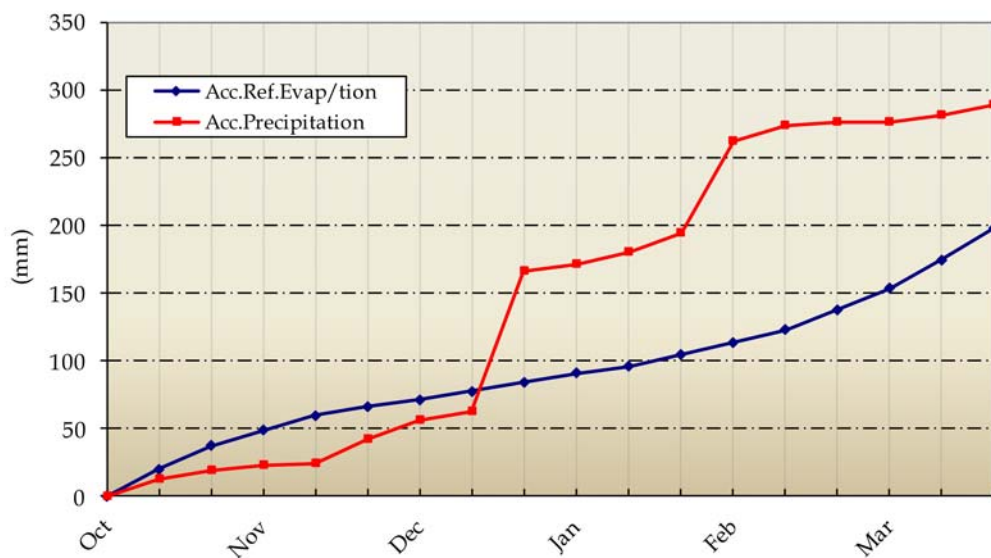


Trikala Imathias

2nd 10-day period (11-20/03/2009)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	12.6	13.2	15.4	16.0	16.8	18.6	16.0	14.4	12.4	4.8	14.0	-	13.8
	Min	0.4	5.6	1.6	2.8	-1.4	3.2	6.2	2.4	1.0	0.4	2.2	-	3.6
Relative Humidity	Max	75	95	70	84	85	70	80	75	52	93	78	-	-
	Min	30	40	22	26	25	25	25	30	20	49	29	-	-
Soil Temperature at 10 cm	06 UTC	8.0	8.8	8.0	8.8	8.2	8.8	10.2	9.4	8.0	7.6	8.6	-	8.6
	12 UTC	9.4	11.4	11.0	11.2	11.2	11.2	12.0	12.4	11.0	7.0	10.8	-	9.1
Sunshine Duration		0.6	4.9	9.3	10.5	10.7	4.8	3.4	5.2	10.3	0.0	6.0	-	4.9
Precipitation			2.0								6.0	8.0	-	19.5
Evaporation		1.0	4.4	3.0	1.2	1.2	4.6	0.8	4.8	3.0	0.7	24.7	-	17.7
Growing Degrees	5	1.5	4.4	3.5	4.4	2.7	5.9	6.1	3.4	1.7	0.0	33.6	-	39.3
	10	0.0	0.0	0.0	0.0	0.0	0.9	1.1	0.0	0.0	0.0	2.0	-	7.6

2nd 10-day period (11-20/03/2009)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	23.6	-	17.3
Precipitation - Reference Evapotranspiration	-15.6	-	2.2
Number of Rainy Days	2.0	-	2.8
Number of Dry Days	5.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

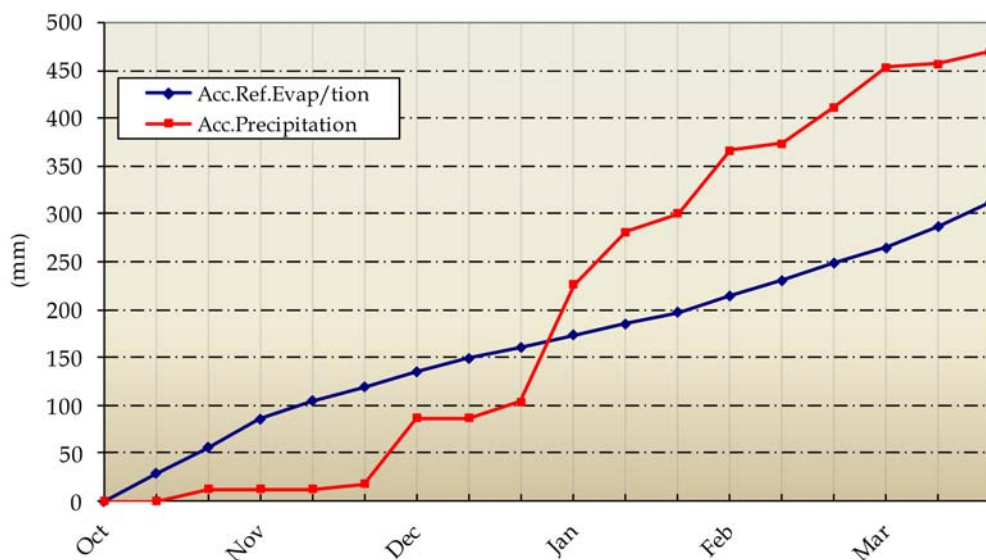


Tympaki

2nd 10-day period (11-20/03/2009)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	17.4	17.4	15.4	17.0	18.0	17.0	17.0	16.6	15.4	15.2	16.6	-	16.9
	Min	6.0	5.6	9.6	8.0	6.4	5.4	6.0	7.8	9.2	5.0	6.9	-	7.8
Relative Humidity	Max	95	95	95	87	91	93	94	95	75	90	91	-	-
	Min	49	61	46	37	34	37	45	58	22	29	42	-	-
Soil Temperature at 10 cm	06 UTC	11.8	12.0	13.0	11.0	11.4	11.2	12.2	13.2	14.0	11.0	12.1	-	13.4
	12 UTC	16.6	-	14.6	16.0	16.6	16.8	17.6	17.6	17.0	17.0	16.6	-	16.0
Sunshine Duration		9.1	2.8	6.2	7.5	8.3	9.7	9.4	6.8	5.9	9.1	7.5	-	6.6
Precipitation			4.3	8.9								13.2	-	17.4
Evaporation		4.0	1.9	2.3	4.0	5.0	3.0	4.0	3.0	6.0	4.0	37.2	-	40.0
Growing Degrees	5	6.7	6.5	7.5	7.5	7.2	6.2	6.5	7.2	7.3	5.1	67.7	-	73.3
	10	1.7	1.5	2.5	2.5	2.2	1.2	1.5	2.2	2.3	0.1	17.7	-	25.5

2nd 10-day period (11-20/03/2009)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	25.4	-	24.5
Precipitation - Reference Evapotranspiration	-12.2	-	-7.1
Number of Rainy Days	2.0	-	2.8
Number of Dry Days	3.0	-	-

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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