



# AGROMETEOROLOGICAL BULLETIN

*March 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



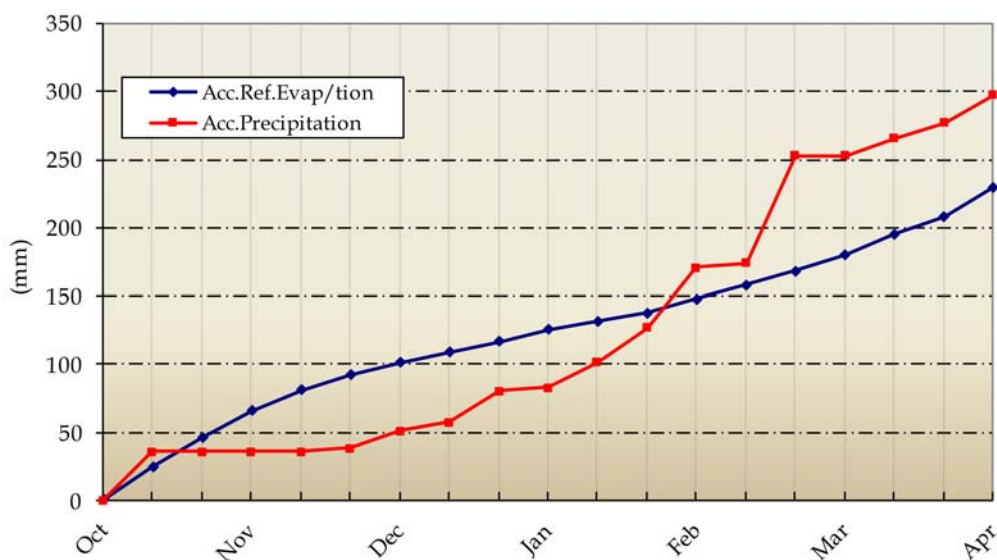
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3rd 10-day period (21-31/03/2009)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	10.8	7.2	12.0	14.0	14.8	9.8	10.6	13.6	12.6	16.6	21.4	13.0	-	14.1
	Min	5.0	3.0	3.4	0.6	9.8	3.2	-1.8	2.8	2.6	10.2	9.6	4.4	-	4.9
Relative Humidity	Max	94	93	93	92	90	79	82	93	90	88	95	90	-	-
	Min	46	71	54	54	67	49	37	57	67	63	52	56	-	-
Soil Temperature at 10 cm	06 UTC	6.6	6.0	6.0	6.0	9.6	8.0	5.8	7.2	8.6	10.0	11.6	7.8	-	8.3
	12 UTC	7.6	7.6	8.8	10.4	11.4	9.0	9.6	11.6	1.4	13.0	13.4	9.4	-	11.0
Sunshine Duration		0.3	0.4	5.5	10.9	1.5	0.3	10.4	10.8	1.8	3.3	10.0	5.0	-	5.5
Precipitation		0.2	15.3	0.2		2.2	0.6			1.3			19.8	-	15.2
Evaporation		1.2	0.7	1.9	1.9	2.2	0.0	0.0	3.5	1.8	1.7	3.8	18.7	-	32.3
Growing Degrees	5	2.9	0.1	2.7	2.3	7.3	1.5	0.0	3.2	2.6	8.4	10.5	41.5	-	51.2
	10	0.0	0.0	0.0	0.0	2.3	0.0	0.0	0.0	0.0	3.4	5.5	11.2	-	11.3

3rd 10-day period (21-31/03/2009)	Previous Year Value	Past Years Mean Value	
Reference Evapotranspiration	21.5	-	23.3
Precipitation - Reference Evapotranspiration	-1.7	-	-8.1
Number of Rainy Days	6.0	-	2.7
Number of Dry Days	1.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

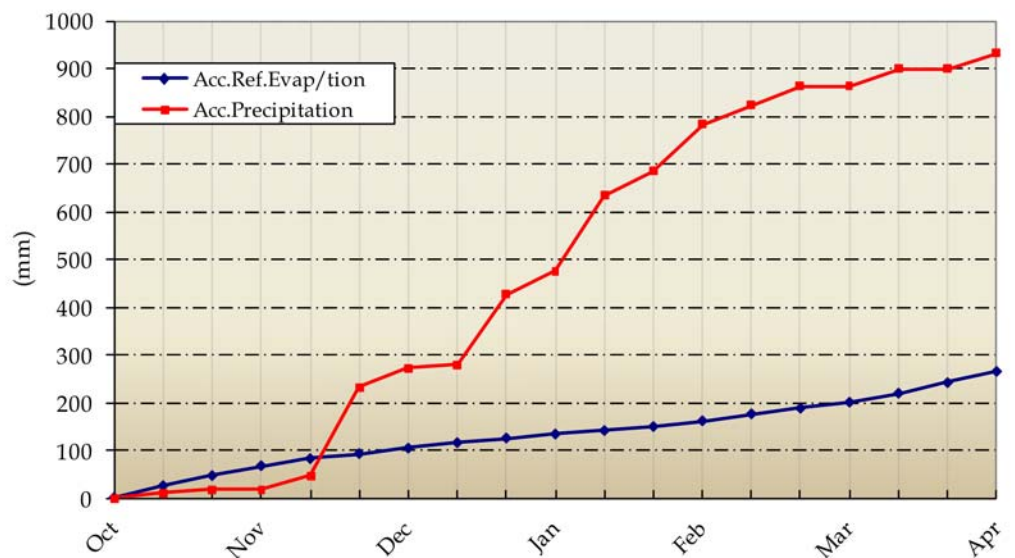


Andravida

3rd 10-day period (21-31/03/2009)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	13.0	11.6	12.2	16.0	15.8	14.6	14.8	16.6	19.4	23.2	21.6	16.3	-	17.4
	Min	8.8	5.4	3.4	3.8	8.8	4.4	5.0	4.6	8.8	10.0	11.4	6.8	-	7.7
Relative Humidity	Max	95	94	94	91	88	97	94	94	90	95	95	94	-	-
	Min	72	54	43	57	62	44	54	50	43	44	63	53	-	-
Soil Temperature at 10 cm	06 UTC	11.0	10.4	8.4	9.2	12.0	10.0	10.2	10.4	12.8	13.8	14.2	11.1	-	11.5
	12 UTC	13.2	13.0	12.6	14.4	12.4	14.0	15.2	16.0	13.6	18.0	17.8	14.6	-	14.2
Sunshine Duration		1.8	3.9	9.9	10.0	6.0	6.6	10.8	10.2	4.0	2.2	0.6	6.0	-	6.8
Precipitation		11.0	13.0			5.0	1.0	3.0					33.0	-	19.5
Evaporation		0.0	9.0	1.0	7.0	3.5	1.0	2.7	0.8	5.0	2.5	1.0	33.5	-	33.3
Growing Degrees	5	5.9	3.5	2.8	4.9	7.3	4.5	4.9	5.6	9.1	11.6	11.5	71.6	-	83.1
	10	0.9	0.0	0.0	0.0	2.3	0.0	0.0	0.6	4.1	6.6	6.5	21.0	-	30.3

3rd 10-day period (21-31/03/2009)	Previous Year Value	Past Years Mean Value	
Reference Evapotranspiration	23.6	-	27.1
Precipitation - Reference Evapotranspiration	9.4	-	-7.6
Number of Rainy Days	5.0	-	3.2
Number of Dry Days	10.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

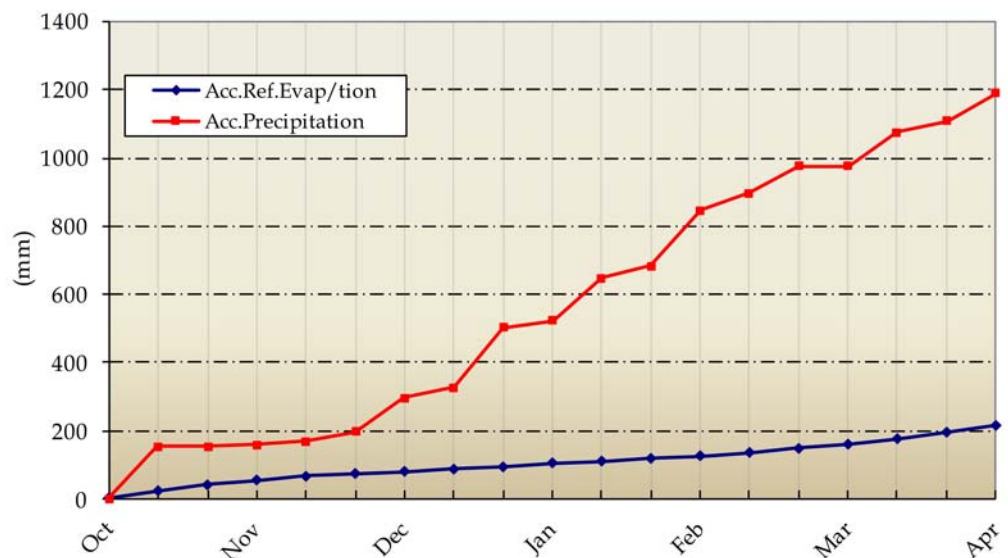


Arta

3rd 10-day period (21-31/03/2009)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	13.8	12.0	16.0	16.2	14.8	13.6	16.4	18.0	16.6	22.8	24.6	16.8	-	18.1
	Min	6.4	5.6	3.0	1.4	7.0	4.0	0.8	4.0	8.6	12.6	10.8	5.8	-	6.9
Relative Humidity	Max	99	99	96	98	98	99	99	98	99	95	99	98	-	-
	Min	71	48	20	31	63	38	25	25	17	24	29	36	-	-
Soil Temperature at 10 cm	06 UTC	9.2	9.1	9.6	9.0	11.0	9.4	8.4	9.0	9.6	12.4	13.2	10.0	-	10.8
	12 UTC	10.4	11.0	-	10.4	11.0	11.4	9.8	10.4	11.0	-	14.2	11.1	-	13.8
Sunshine Duration		1.0	2.4	7.6	8.0	0.5	4.0	10.0	10.6	2.0	4.5	0.1	4.6	-	6.1
Precipitation		42.1	1.0			18.1	16.1	4.0					81.3	-	33.2
Evaporation		0.1	1.6	1.9	3.1	1.2	3.1	1.8	1.9	1.8	4.0	2.0	22.5	-	-
Growing Degrees	5	5.1	3.8	4.5	3.8	5.9	3.8	3.6	6.0	7.6	12.7	12.7	69.5	-	81.0
	10	0.1	0.0	0.0	0.0	0.9	0.0	0.0	1.0	2.6	7.7	7.7	20.0	-	30.2

3rd 10-day period (21-31/03/2009)	Previous Year Value	Past Years Mean Value	
Reference Evapotranspiration	20.1	-	24.4
Precipitation - Reference Evapotranspiration	61.2	-	8.8
Number of Rainy Days	5.0	-	3.7
Number of Dry Days	0.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

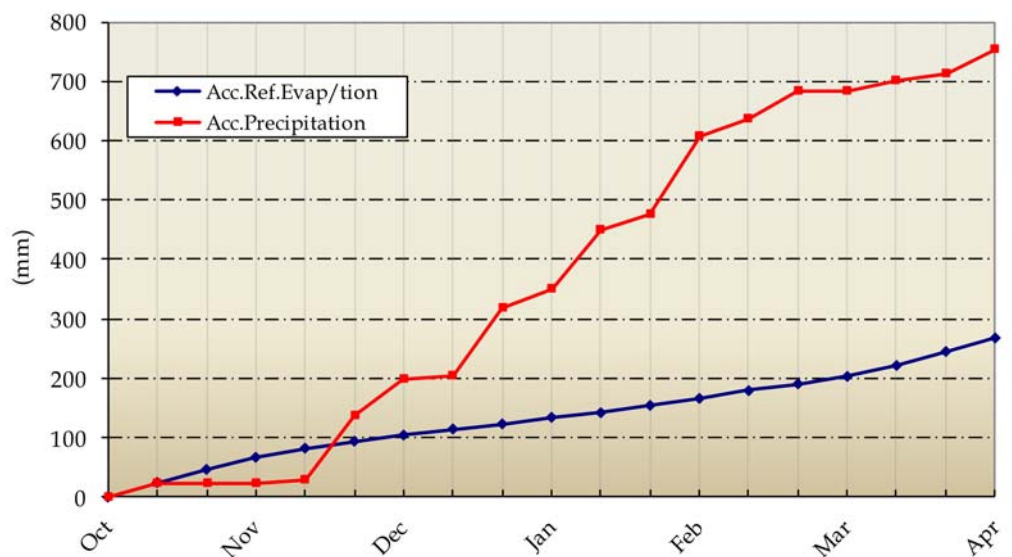


Kalamata

3rd 10-day period (21-31/03/2009)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	13.8	10.4	14.0	16.4	16.4	18.4	15.2	16.6	18.8	19.8	22.4	16.6	-	17.8
	Min	8.2	5.6	1.8	2.8	9.4	4.0	5.8	5.0	6.8	9.2	11.2	6.3	-	6.9
Relative Humidity	Max	94	97	96	93	94	97	97	94	90	89	90	94	-	-
	Min	77	68	40	45	61	41	45	43	41	55	54	52	-	-
Soil Temperature at 10 cm	06 UTC	11.4	12.0	10.0	10.0	11.6	11.0	11.0	11.0	12.0	-	13.2	11.3	-	11.8
	12 UTC	11.4	11.6	11.0	12.4	12.6	12.8	12.8	12.8	13.4	13.8	14.4	12.6	-	14.2
Sunshine Duration		1.7	1.6	9.1	9.8	4.0	7.0	10.5	10.3	6.7	0.1	0.0	5.5	-	6.5
Precipitation		25.5	7.5			0.6	2.3	3.6					39.5	-	20.1
Evaporation		0.0	0.5	5.0	0.0	0.6	0.3	3.0	5.0	3.0	3.0	1.0	21.4	-	37.4
Growing Degrees	5	6.0	3.0	2.9	4.6	7.9	6.2	5.5	5.8	7.8	9.5	11.8	71.0	-	81.3
	10	1.0	0.0	0.0	0.0	2.9	1.2	0.5	0.8	2.8	4.5	6.8	20.5	-	28.3

3rd 10-day period (21-31/03/2009)	Previous Year Value	Past Years Mean Value	
Reference Evapotranspiration	22.9	-	27.8
Precipitation - Reference Evapotranspiration	16.6	-	-7.7
Number of Rainy Days	5.0	-	3.3
Number of Dry Days	8.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

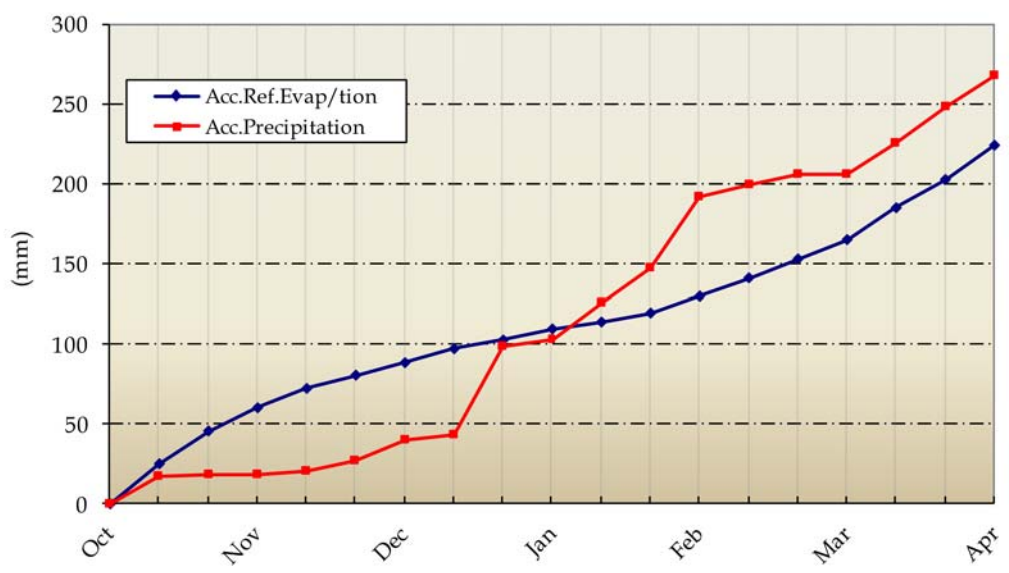


Larisa

3rd 10-day period (21-31/03/2009)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	11.0	9.8	13.2	16.8	15.2	13.0	15.0	18.4	17.0	21.2	24.0	15.9	-	16.9
	Min	6.2	4.8	3.0	-1.0	1.8	1.8	-0.4	0.0	6.0	8.6	10.0	3.7	-	4.2
Relative Humidity	Max	97	94	92	92	92	93	100	93	97	95	89	94	-	-
	Min	71	62	40	33	54	47	47	33	56	58	60	51	-	-
Soil Temperature at 10 cm	06 UTC	8.6	8.4	8.2	8.0	8.6	8.4	7.4	8.8	10.6	11.4	13.0	9.2	-	10.0
	12 UTC	9.0	10.2	10.6	10.6	10.6	10.8	12.6	11.8	12.0	13.4	14.8	11.5	-	11.4
Sunshine Duration		0.0	3.5	8.0	9.3	3.9	3.6	9.1	10.0	2.2	2.8	1.8	4.9	-	6.0
Precipitation		7.6	9.2			3.2	0.0						20.0	-	11.3
Evaporation		2.4	2.9	0.6	1.5	6.1	11.4	4.5	3.4	0.8	1.5	0.2	35.3	-	32.5
Growing Degrees	5	3.6	2.3	3.1	2.9	3.5	2.4	2.3	4.2	6.5	9.9	12.0	52.7	-	61.7
	10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5	4.9	7.0	13.4	-	16.3

3rd 10-day period (21-31/03/2009)	Previous Year Value	Past Years Mean Value	
Reference Evapotranspiration	21.4	-	25.6
Precipitation - Reference Evapotranspiration	-1.4	-	-14.3
Number of Rainy Days	3.0	-	3.1
Number of Dry Days	2.0	-	-

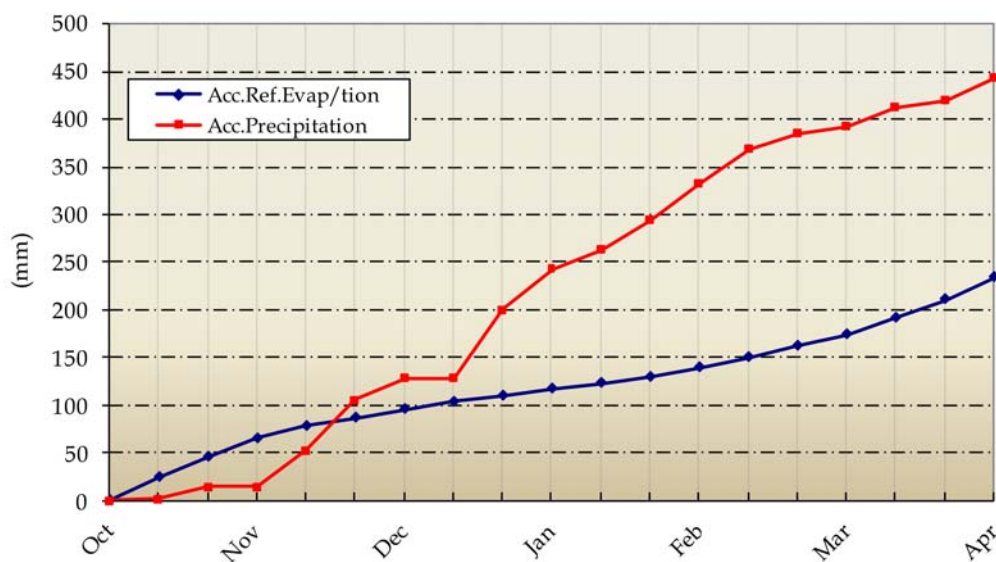
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



3rd 10-day period (21-31/03/2009)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	14.0	15.2	15.0	20.4	19.2	18.8	16.2	17.2	17.2	19.0	27.4	18.1	-	18.2
	Min	3.4	3.6	1.8	-1.2	4.2	1.6	1.0	0.8	4.0	7.6	9.2	3.3	-	4.8
Relative Humidity	Max	95	94	88	90	82	94	94	92	94	95	90	92	-	-
	Min	87	35	35	32	40	24	41	43	58	65	51	46	-	-
Soil Temperature at 10 cm	06 UTC	9.4	9.2	8.0	6.4	9.6	8.0	9.2	8.4	9.6	12.0	12.4	9.3	-	9.5
	12 UTC	11.4	12.8	12.0	14.0	12.6	13.6	15.0	14.4	14.4	14.4	16.6	13.7	-	15.5
Sunshine Duration		1.3	3.4	9.2	10.6	5.4	8.2	10.4	10.6	4.6	0.7	0.4	5.9	-	6.1
Precipitation		17.6				3.6		2.1					23.3	-	16.3
Evaporation		1.1	0.9	3.0	3.5	1.1	2.3	4.0	3.8	2.4	1.0	1.7	24.8	-	31.1
Growing Degrees	5	3.7	4.4	3.4	4.6	6.7	5.2	3.6	4.0	5.6	8.3	13.3	62.8	-	70.6
	10	0.0	0.0	0.0	0.0	1.7	0.2	0.0	0.0	0.6	3.3	8.3	14.1	-	21.2

3rd 10-day period (21-31/03/2009)	Previous Year Value	Past Years Mean Value	
Reference Evapotranspiration	23.2	-	24.6
Precipitation - Reference Evapotranspiration	0.1	-	-8.3
Number of Rainy Days	3.0	-	3.2
Number of Dry Days	2.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

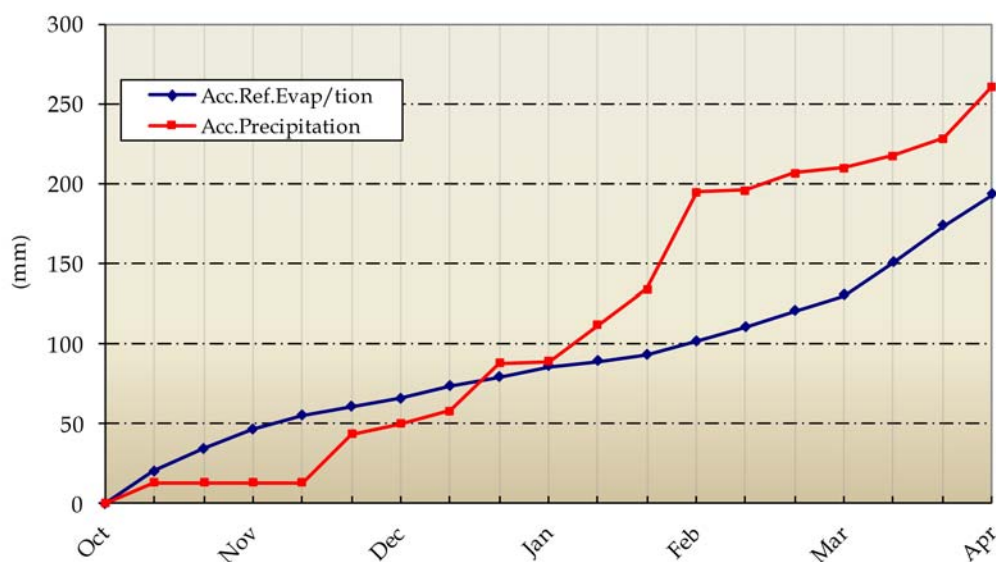


3rd 10-day period (21-31/03/2009)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	9.2	8.4	13.4	16.4	15.0	11.8	15.6	18.0	14.4	21.0	22.0	15.0	-	16.7
	Min	-1.0	3.6	2.0	1.0	5.0	2.0	-0.6	1.0	6.8	8.4	9.0	3.4	-	5.3
Relative Humidity	Max	93	93	81	71	85	76	94	94	91	87	84	86	-	-
	Min	67	71	33	30	52	38	29	44	62	49	43	47	-	-
Soil Temperature at 10 cm	06 UTC	7.0	7.2	7.4	7.2	8.8	8.2	7.6	8.4	10.0	10.2	11.8	8.5	-	9.4
	12 UTC	7.2	7.4	8.2	8.6	10.4	8.4	8.6	9.4	10.2	11.0	12.4	9.3	-	11.6
Sunshine Duration		0.0	0.0	9.8	10.5	1.0	4.1	10.0	10.0	0.0	3.6	1.1	4.6	-	5.2
Precipitation		17.0	6.6			2.5	6.4						32.5	-	12.8
Evaporation		5.1	1.0	2.0	2.0	0.0	1.1	1.0	2.2	1.2	1.3	1.2	18.1	-	24.9
Growing Degrees	5	0.0	1.0	2.7	3.7	5.0	1.9	2.5	4.5	5.6	9.7	10.5	47.1	-	66.5
	10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	4.7	5.5	10.8	-	20.1

Series

3rd 10-day period (21-31/03/2009)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	19.6	-	21.5
Precipitation - Reference Evapotranspiration	12.9	-	-8.7
Number of Rainy Days	4.0	-	3.0
Number of Dry Days	0.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



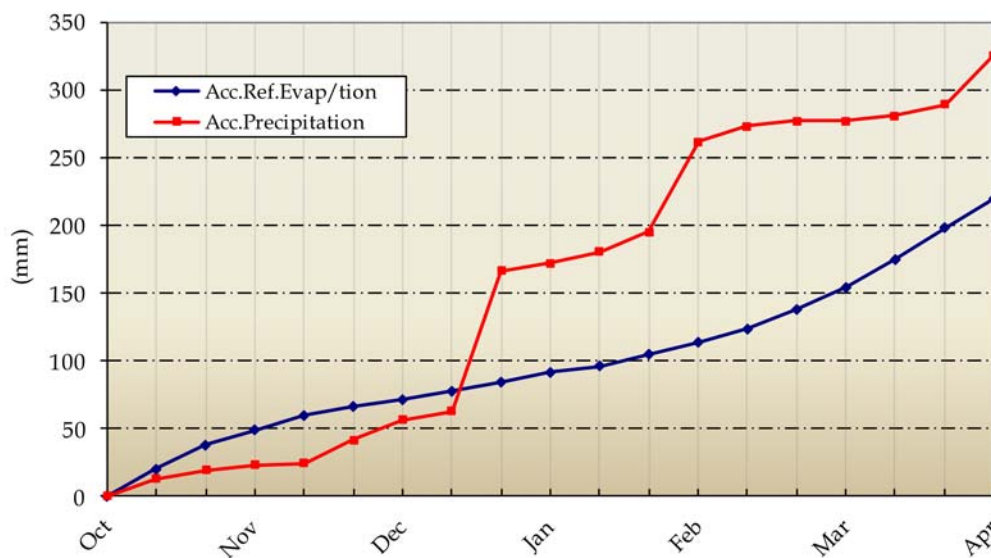


Trikala Imathias

3rd 10-day period (21-31/03/2009)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	6.0	8.2	13.4	16.4	-	16.0	16.2	18.0	-	20.6	20.4	15.0	-	16.5
	Min	3.8	3.4	1.6	0.2	-	0.0	0.2	3.2	-	8.8	10.4	3.5	-	5.7
Relative Humidity	Max	94	94	92	-	85	92	96	-	98	95	97	94	-	-
	Min	93	60	34	-	33	33	28	-	70	52	60	51	-	-
Soil Temperature at 10 cm	06 UTC	7.0	7.0	5.6	6.2	-	6.2	7.0	8.2	-	10.2	11.4	7.6	-	10.0
	12 UTC	7.2	7.4	-	10.0	-	6.6	10.2	10.8	-	12.0	13.2	9.7	-	10.8
Sunshine Duration		0.0	0.0	7.7	-	1.2	5.9	10.3	-	1.2	4.4	0.4	3.5	-	5.4
Precipitation		21.7	14.8										36.5	-	15.8
Evaporation		9.6	2.8	3.0	-	1.9	3.9	1.2	-	3.6	0.8	2.2	-	-	25.9
Growing Degrees	5	0.0	0.8	2.5	3.3	-	3.0	3.2	5.6	-	9.7	10.4	-	-	66.5
	10	0.0	0.0	0.0	0.0	-	0.0	0.0	0.6	-	4.7	5.4	-	-	21.0

3rd 10-day period (21-31/03/2009)	Previous Year Value	Past Years Mean Value	
Reference Evapotranspiration	21.3	-	23.1
Precipitation - Reference Evapotranspiration	15.2	-	-7.3
Number of Rainy Days	2.0	-	3.0
Number of Dry Days	0.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

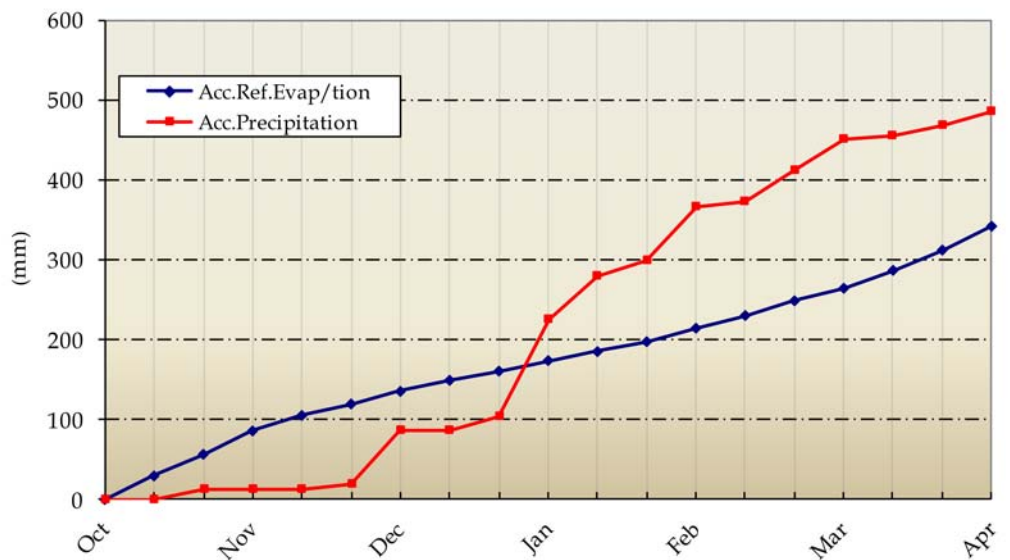


Tympaki

3rd 10-day period (21-31/03/2009)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	17.4	16.0	13.8	16.2	18.0	15.8	15.8	16.8	17.8	19.8	24.6	17.5	-	18.4
	Min	3.2	9.4	4.4	3.0	12.6	10.0	9.8	5.2	6.4	8.0	14.6	7.9	-	8.9
Relative Humidity	Max	96	95	93	94	96	97	93	96	95	92	87	94	-	-
	Min	54	47	53	47	59	43	32	41	36	42	38	45	-	-
Soil Temperature at 10 cm	06 UTC	11.4	13.2	11.6	10.0	14.2	13.6	13.4	11.0	12.2	14.0	17.2	12.9	-	14.3
	12 UTC	15.0	16.6	5.2	16.2	18.4	18.0	16.4	17.0	18.6	20.0	21.0	16.6	-	17.1
Sunshine Duration		0.8	6.9	6.0	8.6	5.6	7.3	8.9	10.7	9.2	7.3	0.3	6.5	-	7.3
Precipitation		0.3	3.3	0.9	0.2		2.1	10.3					17.1	-	10.6
Evaporation		2.3	4.1	4.0	6.2	5.5	5.9	6.0	4.0	4.0	4.0	3.0	49.0	-	46.0
Growing Degrees	5	5.3	7.7	4.1	4.6	10.3	7.9	7.8	6.0	7.1	8.9	14.6	84.3	-	95.2
	10	0.3	2.7	0.0	0.0	5.3	2.9	2.8	1.0	2.1	3.9	9.6	30.6	-	40.5

3rd 10-day period (21-31/03/2009)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	29.8	-	30.5
Precipitation - Reference Evapotranspiration	-12.7	-	-19.9
Number of Rainy Days	6.0	-	1.9
Number of Dry Days	7.0	-	-

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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