

# AGROMETEOROLOGICAL BULLETIN

*January 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



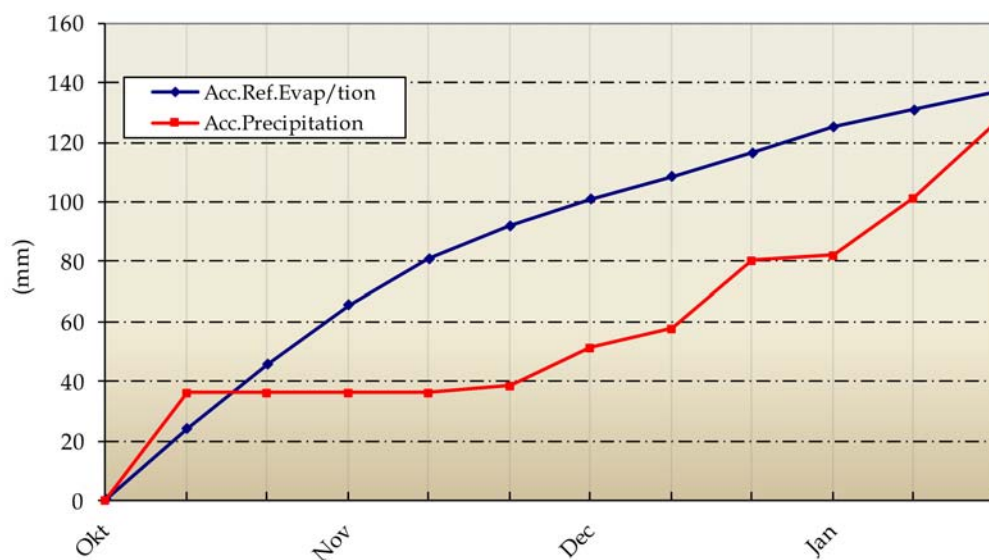
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2nd 10-day period (11-20/01/2009)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	4.6	6.4	4.8	8.2	15.0	9.8	7.0	10.6	12.8	14.8	9.4	-	8.0
	Min	-4.6	-3.0	-5.0	-0.4	6.2	6.8	4.0	0.6	4.0	3.4	1.2	-	0.2
Relative Humidity	Max	88	92	96	100	100	100	86	89	97	100	95	-	-
	Min	46	41	71	88	89	74	62	64	60	76	67	-	-
Soil Temperature at 10 cm	06 UTC	1.8	2.0	1.4	2.4	6.0	8.4	6.6	5.0	6.2	6.2	4.6	-	4.2
	12 UTC	2.0	2.0	1.6	3.0	7.4	8.0	6.6	7.0	8.0	7.2	5.3	-	5.1
Sunshine Duration		8.4	8.1	0.0	0.0	0.8	0.1	3.3	5.1	7.6	4.4	3.8	-	3.1
Precipitation					6.0	12.0	7.0					25.0	-	14.8
Evaporation		0.0	0.0	0.0	0.0	0.0	4.1	1.5	0.0	2.5	1.2	9.3	-	6.6
Growing Degrees	5	0.0	0.0	0.0	0.0	5.6	3.3	0.5	0.6	3.4	4.1	17.5	-	9.4
	10	0.0	0.0	0.0	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.6	-	0.9

2nd 10-day period (11-20/01/2009)	Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	6.0	8.8
Precipitation - Reference Evapotranspiration	19.0	6.0
Number of Rainy Days	3.0	2.1
Number of Dry Days	4.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

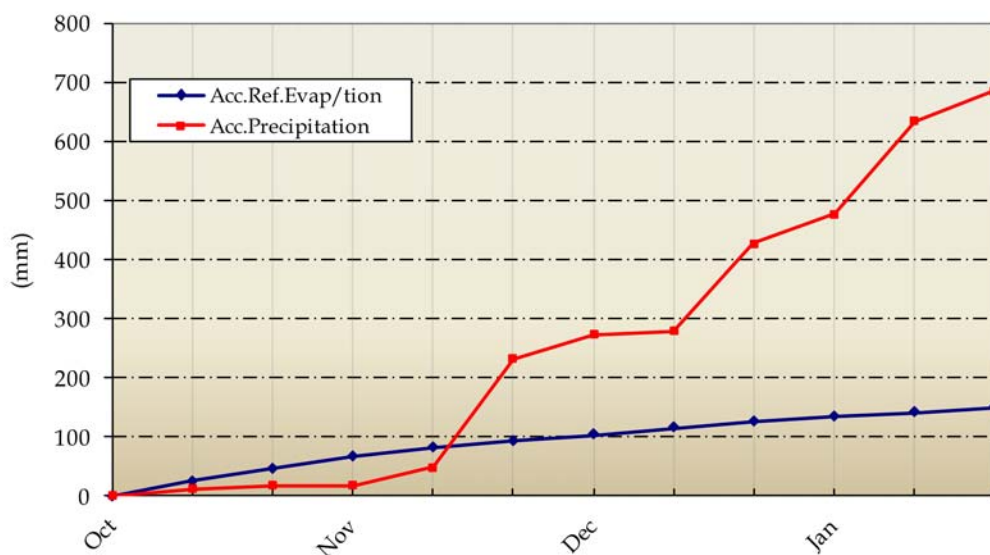


Andravida

2nd 10-day period (11-20/01/2009)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	14.2	13.4	15.0	15.4	17.4	15.2	14.4	14.2	16.8	16.8	15.3	-	13.6
	Min	4.6	2.8	5.4	10.4	11.2	9.8	7.8	4.8	9.0	7.2	7.3	-	4.8
Relative Humidity	Max	97	93	97	98	97	100	97	97	95	95	97	-	-
	Min	54	52	60	72	65	74	67	59	53	66	62	-	-
Soil Temperature at 10 cm	06 UTC	8.6	8.6	9.0	9.2	11.6	12.6	11.4	10.6	11.6	11.0	10.4	-	8.3
	12 UTC	10.4	10.4	9.8	11.2	13.6	13.4	12.6	12.2	14.0	12.0	12.0	-	9.8
Sunshine Duration		0.0	6.0	0.0	1.7	7.1	2.9	6.5	7.4	8.4	1.4	4.1	-	4.4
Precipitation				0.5	14.0	10.0	27.0					51.5	-	35.4
Evaporation		0.5	0.3	2.7	4.0	10.4	9.2	0.8	2.0	2.0	1.2	33.1	-	18.1
Growing Degrees	5	4.4	3.1	5.2	7.9	9.3	7.5	6.1	4.5	7.9	7.0	62.9	-	42.4
	10	0.0	0.0	0.2	2.9	4.3	2.5	1.1	0.0	2.9	2.0	15.9	-	7.2

2nd 10-day period (11-20/01/2009)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	8.5	-	9.4
Precipitation - Reference Evapotranspiration	43.0	-	26.0
Number of Rainy Days	4.0	-	3.7
Number of Dry Days	2.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

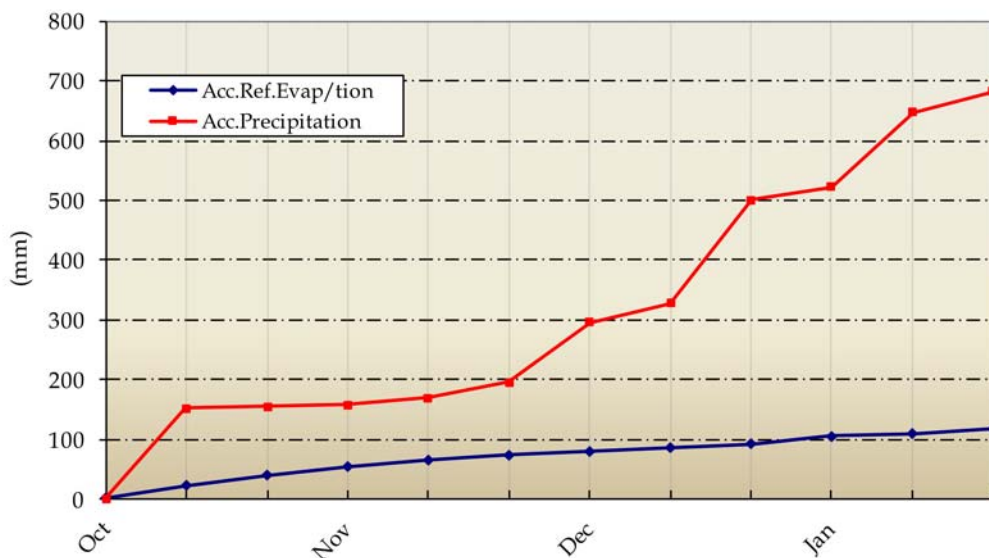


Arta

2nd 10-day period (11-20/01/2009)		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	14.4	12.8	12.8	17.0	15.6	15.6	15.0	17.6	15.0	14.9	-	13.9
	Min	3.0	7.0	2.6	9.4	10.0	7.0	1.8	1.4	5.0	4.4	5.2	-	2.8
Relative Humidity	Max	83	65	79	92	94	91	94	94	97	96	88	-	-
	Min	13	12	31	75	57	74	34	46	39	52	43	-	-
Soil Temperature at 10 cm	06 UTC	8.4	8.2	8.0	8.8	9.6	9.8	-	8.0	9.0	8.8	8.7	-	6.5
	12 UTC	8.8	8.4	8.2	9.2	10.4	10.4	9.2	8.2	9.4	9.4	9.2	-	7.9
Sunshine Duration		5.7	0.0	0.0	0.0	2.6	3.2	8.3	4.7	5.6	0.8	3.1	-	4.5
Precipitation				4.0	25.0	6.0						35.0	-	40.3
Evaporation		-	-	-	-	-	2.1	-	-	-	-	-	-	-
Growing Degrees	5	3.3	5.7	2.7	6.1	8.5	6.3	3.7	3.2	6.3	4.7	50.5	-	34.7
	10	0.0	0.7	0.0	1.1	3.5	1.3	0.0	0.0	1.3	0.0	7.9	-	4.3

2nd 10-day period (11-20/01/2009)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	7.9	-	7.6
Precipitation - Reference Evapotranspiration	27.1	-	32.7
Number of Rainy Days	3.0	-	3.1
Number of Dry Days	3.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

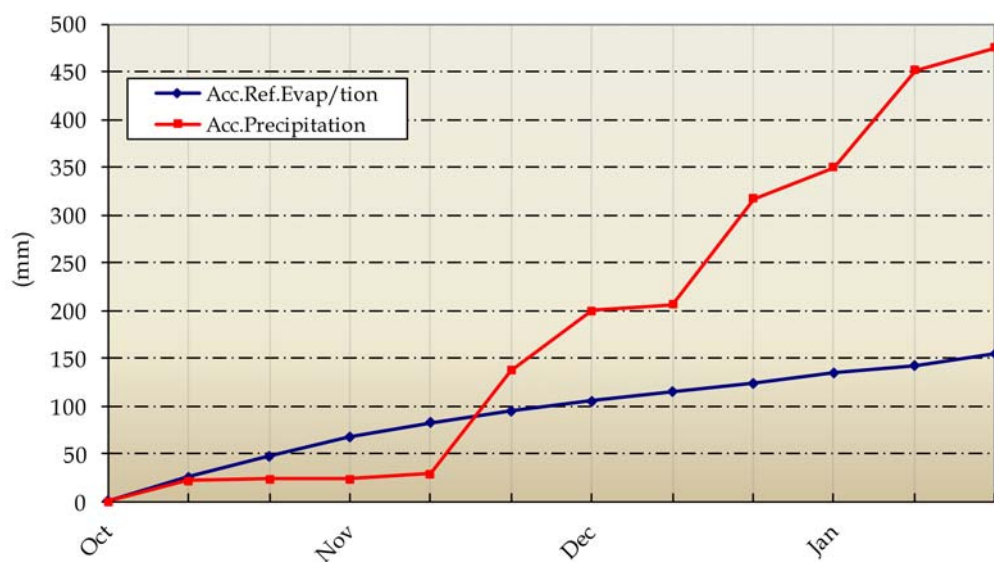


Kalamata

2nd 10-day period (11-20/01/2009)		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	14.4	12.4	17.8	17.0	16.0	16.8	15.4	17.6	18.2	16.2	-	14.6
	Min	9.4	6.0	7.4	10.4	9.2	10.0	7.0	5.0	5.4	5.6	7.5	-	4.9
Relative Humidity	Max	85	85	95	97	97	97	97	94	95	91	93	-	-
	Min	45	40	66	68	76	71	47	47	45	59	56	-	-
Soil Temperature at 10 cm	06 UTC	11.2	10.0	10.0	11.0	11.6	11.6	11.0	10.2	10.6	10.4	10.8	-	9.0
	12 UTC	11.4	10.4	10.4	11.6	12.0	12.2	11.6	10.6	11.4	11.2	11.3	-	10.1
Sunshine Duration		5.3	5.4	0.0	0.0	4.6	2.9	7.8	7.8	7.2	4.3	4.5	-	4.2
Precipitation		1.0		4.0	12.0	1.0	6.0			0.2		24.2	-	39.7
Evaporation		2.9	2.0	1.4	0.0	0.0	5.0	1.0	0.2	1.0	0.3	13.8	-	23.4
Growing Degrees	5	8.1	5.2	4.9	9.1	8.1	8.0	6.9	5.2	6.5	6.9	68.9	-	47.5
	10	3.1	0.2	0.0	4.1	3.1	3.0	1.9	0.2	1.5	1.9	19.0	-	8.1

2nd 10-day period (11-20/01/2009)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	12.4	-	11.1
Precipitation - Reference Evapotranspiration	11.8	-	28.6
Number of Rainy Days	6.0	-	4.2
Number of Dry Days	4.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



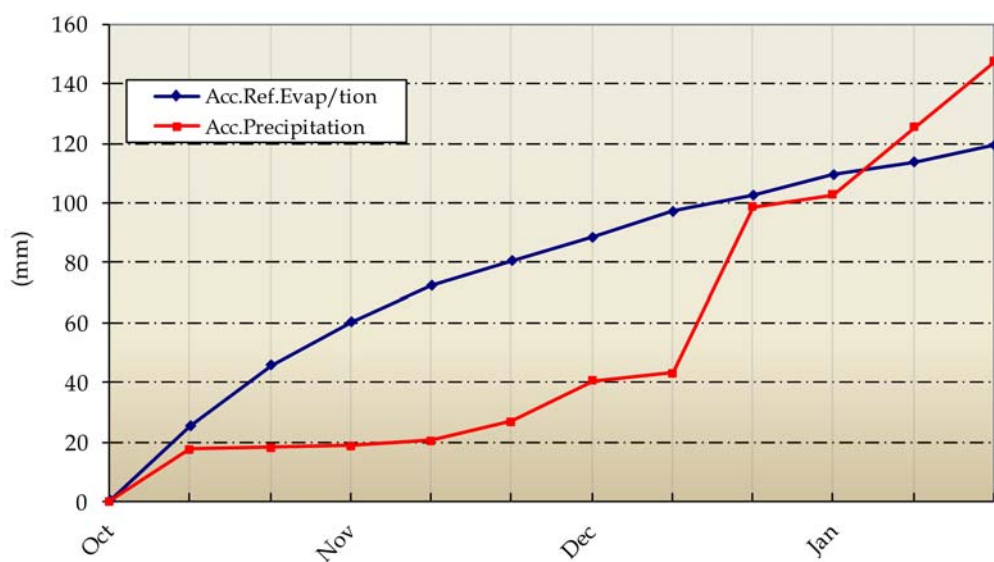


Larisa

2nd 10-day period (11-20/01/2009)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	5.4	8.4	5.4	6.4	8.6	11.0	10.0	9.6	14.0	15.4	9.4	-	9.3
	Min	3.6	4.0	2.0	3.8	5.4	7.0	-	-2.0	-0.2	0.8	2.7	-	0.0
Relative Humidity	Max	93	89	100	100	100	-	100	96	100	100	98	-	-
	Min	80	62	84	97	97	-	55	67	69	58	74	-	-
Soil Temperature at 10 cm	06 UTC	6.8	6.6	6.4	6.4	6.8	7.8	-	6.2	6.0	6.2	6.6	-	5.0
	12 UTC	6.6	7.0	6.4	6.4	7.4	7.6	7.4	6.4	7.0	7.2	6.9	-	5.5
Sunshine Duration		0.0	0.9	0.0	0.0	0.0	-	5.6	4.6	5.5	6.8	2.6	-	3.6
Precipitation				4.0	18.0							22.0	-	10.3
Evaporation		0.5	0.0	0.0	0.0	0.5	-	0.0	0.0	0.5	0.1	-	-	5.9
Growing Degrees	5	0.0	1.2	0.0	0.1	2.0	4.0	-	0.0	1.9	3.1	-	-	9.7
	10	0.0	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	-	-	0.4

2nd 10-day period (11-20/01/2009)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	5.6	-	6.4
Precipitation - Reference Evapotranspiration	16.4	-	3.9
Number of Rainy Days	2.0	-	2.8
Number of Dry Days	3.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

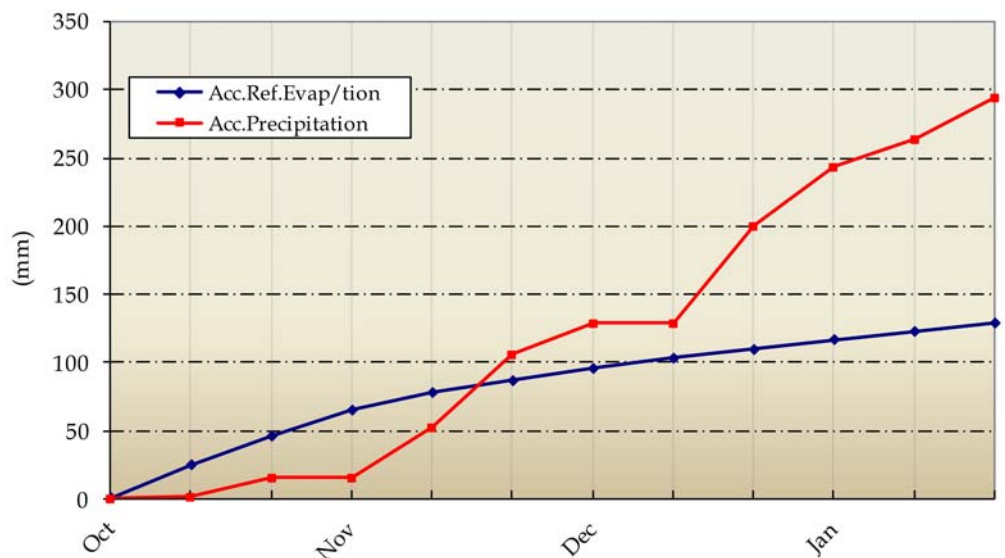


Pyrgela

2nd 10-day period (11-20/01/2009)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	12.8	10.4	7.8	15.2	19.4	18.0	18.0	7.4	20.2	17.6	14.7	-	14.4
	Min	8.4	-1.2	6.2	7.0	4.8	6.4	2.0	5.4	5.1	3.8	4.8	-	2.4
Relative Humidity	Max	86	93	94	95	95	97	96	94	94	93	94	-	-
	Min	58	50	77	95	64	64	52	55	43	46	60	-	-
Soil Temperature at 10 cm	06 UTC	9.2	6.0	7.6	8.8	8.2	8.2	8.0	9.8	9.6	8.2	8.4	-	6.3
	12 UTC	10.0	8.0	8.0	10.2	11.0	11.0	10.2	11.6	11.4	10.6	10.2	-	9.4
Sunshine Duration		3.1	2.5	0.0	0.0	4.8	2.7	5.2	6.3	7.6	5.1	3.7	-	4.3
Precipitation				8.0	23.0		0.0					31.0	-	25.4
Evaporation		0.7	0.8	0.4	0.4	0.8	1.1	1.2	1.1	1.2	0.9	7.5	-	11.1
Growing Degrees	5	5.6	0.0	2.0	6.1	7.1	7.2	5.0	1.4	7.7	5.7	47.8	-	34.5
	10	0.6	0.0	0.0	1.1	2.1	2.2	0.0	0.0	2.7	0.7	9.4	-	3.5

2nd 10-day period (11-20/01/2009)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	6.2	-	8.0
Precipitation - Reference Evapotranspiration	24.8	-	17.4
Number of Rainy Days	2.0	-	2.7
Number of Dry Days	3.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

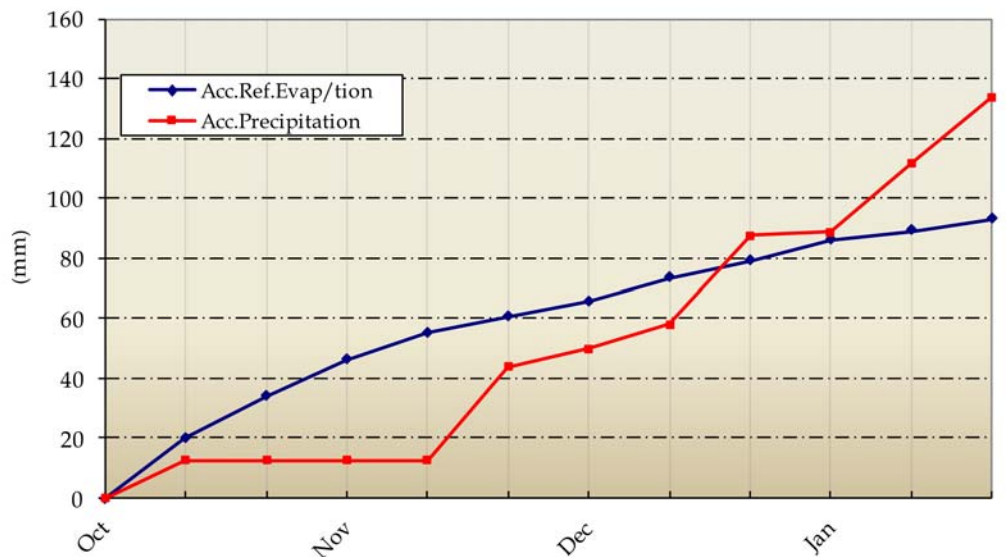


Series

2nd 10-day period (11-20/01/2009)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	4.6	6.6	2.6	4.0	11.4	14.4	9.8	8.0	11.0	13.4	8.6	-	7.4
	Min	-3.2	-2.6	-3.4	-3.6	3.6	5.4	3.8	-3.0	-1.8	-1.6	-0.6	-	-0.8
Relative Humidity	Max	96	92	92	97	97	94	67	92	96	96	92	-	-
	Min	76	56	75	93	80	64	46	57	56	61	66	-	-
Soil Temperature at 10 cm	06 UTC	3.2	3.0	2.8	3.4	4.2	5.8	5.4	3.8	3.0	3.2	3.8	-	3.1
	12 UTC	4.2	4.2	2.6	3.4	4.8	6.4	5.6	3.6	3.6	3.4	4.2	-	3.6
Sunshine Duration		0.9	3.9	0.0	0.0	0.3	3.9	5.6	3.7	4.7	3.7	2.7	-	3.0
Precipitation					18.0	4.0						22.0	-	13.0
Evaporation		-	-	-	-	-	-	-	-	-	-	-	-	2.1
Growing Degrees	5	0.0	0.0	0.0	0.0	2.5	4.9	1.8	0.0	0.0	0.9	10.1	-	6.0
	10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	0.4

2nd 10-day period (11-20/01/2009)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	3.8	-	5.2
Precipitation - Reference Evapotranspiration	18.2	-	7.8
Number of Rainy Days	2.0	-	2.3
Number of Dry Days	4.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



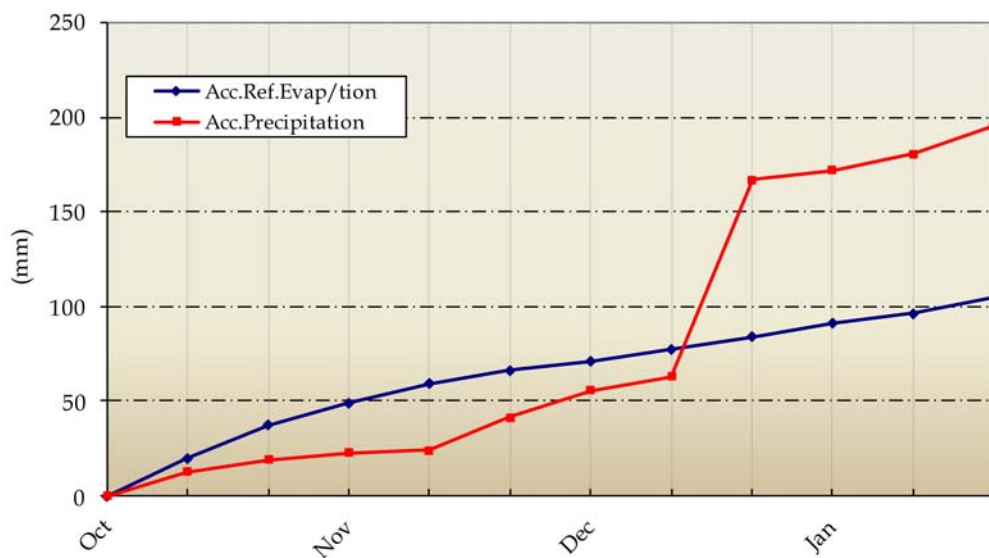


Trikala Imathias

2nd 10-day period (11-20/01/2009)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	5.0	7.0	-	7.0	-	12.0	9.2	-	14.2	16.2	10.1	-	9.1
	Min	-0.6	-0.6	-0.8	2.0	6.0	6.6	4.0	-	0.2	1.8	2.1	-	0.2
Relative Humidity	Max	95	98	98	98	96	95	-	95	96	97	96	-	-
	Min	70	54	86	93	80	75	-	62	59	60	71	-	-
Soil Temperature at 10 cm	06 UTC	3.2	3.4	3.8	4.6	5.8	7.0	6.2	-	4.8	9.4	5.4	-	4.9
	12 UTC	3.2	4.6	4.0	4.8	6.4	8.0	6.4	-	6.0	6.2	5.5	-	5.0
Sunshine Duration		1.1	6.8	0.0	0.0	0.3	2.6	-	4.1	7.2	6.7	3.2	-	3.9
Precipitation					15.0							15.0	-	14.4
Evaporation		-	-	0.5	0.4	0.8	1.0	-	-	0.4	0.8	-	-	2.7
Growing Degrees	5	0.0	0.0	-	0.0	-	4.3	1.6	-	2.2	4.0	-	-	10.8
	10	0.0	0.0	-	0.0	-	0.0	0.0	-	0.0	0.0	-	-	0.3

2nd 10-day period (11-20/01/2009)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	8.6	-	6.4
Precipitation - Reference Evapotranspiration	6.4	-	8.0
Number of Rainy Days	1.0	-	2.7
Number of Dry Days	4.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

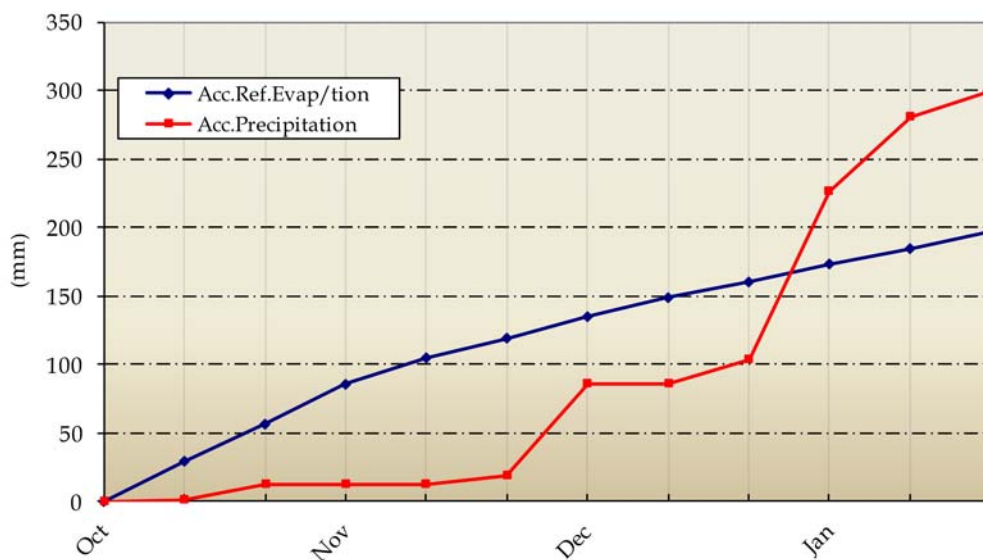


Tympaki

2nd 10-day period (11-20/01/2009)		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	15.4	15.4	19.0	20.0	17.0	18.8	16.4	18.0	18.4	17.6	-	15.6
	Min	10.6	7.0	9.4	12.6	8.8	9.4	8.4	6.6	7.4	9.6	9.0	-	7.0
Relative Humidity	Max	96	74	92	92	98	96	94	94	94	97	93	-	-
	Min	51	41	70	65	60	68	39	53	57	83	59	-	-
Soil Temperature at 10 cm	06 UTC	11.6	10.2	11.0	12.2	12.2	12.6	12.0	10.6	10.6	12.6	11.6	-	10.8
	12 UTC	14.0	13.0	13.0	14.4	14.4	14.0	15.0	13.6	14.0	15.4	14.1	-	12.6
Sunshine Duration		2.0	3.8	0.0	0.2	0.2	1.7	7.9	7.1	6.0	2.4	3.1	-	5.0
Precipitation				1.0	0.1		8.0	9.0			0.9	19.0	-	36.5
Evaporation		0.4	3.0	0.4	1.9	1.0	1.4	3.0	3.0	1.0	0.9	16.0	-	28.6
Growing Degrees	5	9.0	6.2	7.4	10.8	9.4	8.2	8.6	6.5	7.7	9.0	82.8	-	62.9
	10	4.0	1.2	2.4	5.8	4.4	3.2	3.6	1.5	2.7	4.0	32.8	-	16.1

2nd 10-day period (11-20/01/2009)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	12.4	-	14.8
Precipitation - Reference Evapotranspiration	6.6	-	21.7
Number of Rainy Days	5.0	-	3.0
Number of Dry Days	2.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration





## ◆ List of Symbols and Abbreviations

### Reference Evapotranspiration $E_{To}$ (mm):

Calculated by the FAO Penman-Montieth equation

$$E_{T_0} = \frac{0.408 * \Delta * (R_n - G) + \gamma * \frac{900}{T + 273} * u_2 * (e_s - e_a)}{\Delta + \gamma * (1 + 0.34 * u_2)}$$

using 10-day step.

$R_n$  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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