

AGROMETEOROLOGICAL BULLETIN

January 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



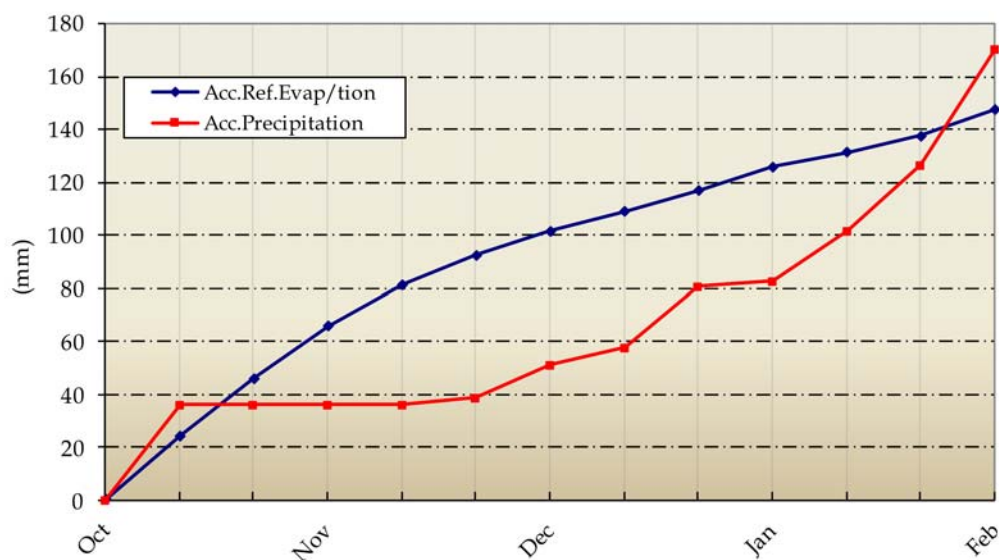
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Web addresses of HNMS
www.hnms.gr
www.emy.gov.gr
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www.meteohellas.gr

3rd 10-day period (21-31/01/2009)		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	16.0	14.2	14.4	16.2	14.4	16.0	14.0	13.6	10.2	5.6	13.5	-	8.8
	Min	9.4	11.6	10.0	11.0	10.8	10.0	4.6	10.2	3.4	3.6	2.6	7.9	-	1.4
Relative Humidity	Max	95	93	97	95	98	95	100	95	97	90	80	94	-	-
	Min	73	68	50	72	81	71	68	77	61	50	62	67	-	-
Soil Temperature at 10 cm	06 UTC	9.6	9.4	10.0	9.4	10.6	11.0	9.0	11.0	8.2	7.5	6.6	9.3	-	4.6
	12 UTC	9.4	9.6	10.0	11.0	12.4	12.2	10.6	11.2	11.0	8.5	7.0	10.3	-	5.8
Sunshine Duration		0.0	3.3	0.0	3.3	4.4	8.0	5.6	1.7	5.7	4.3	4.0	3.7	-	3.3
Precipitation		1.8		5.2	2.0	12.8	13.6	0.0	8.6	0.0		0.0	44.0	-	16.6
Evaporation		0.8	1.0	0.7	1.5	1.0	1.4	5.6	0.1	2.0	1.9	2.0	18.0	-	10.0
Growing Degrees	5	6.6	8.8	7.1	7.7	8.5	7.2	5.3	7.1	3.5	1.9	0.0	63.7	-	16.7
	10	1.6	3.8	2.1	2.7	3.5	2.2	0.3	2.1	0.0	0.0	0.0	18.3	-	2.2

3rd 10-day period (21-31/01/2009)	Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	10.1	10.8
Precipitation - Reference Evapotranspiration	33.9	5.8
Number of Rainy Days	6.0	2.7
Number of Dry Days	4.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

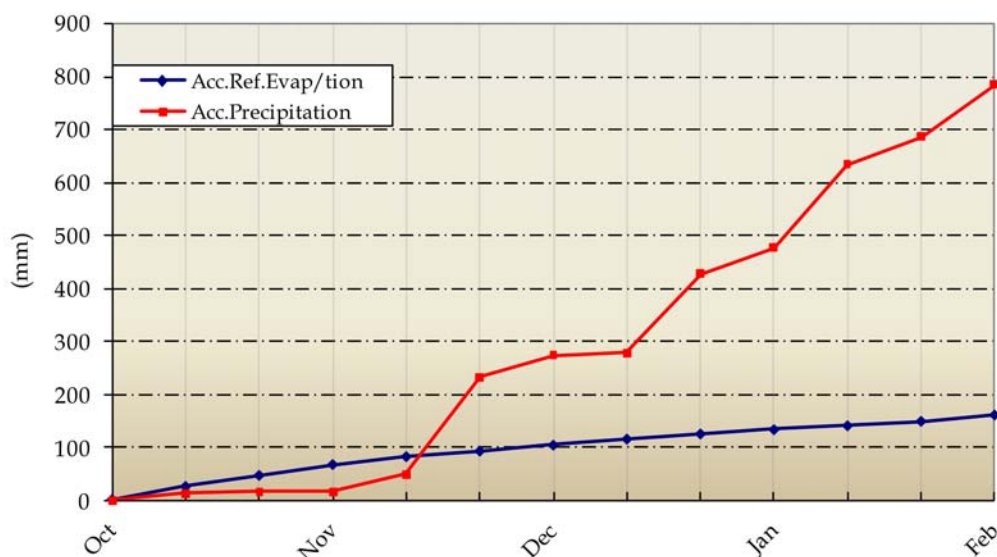


Andravida

3rd 10-day period (21-31/01/2009)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	19.2	19.8	17.8	15.6	15.4	16.0	15.4	12.2	13.4	13.8	11.4	15.5	-	14.0
	Min	12.0	13.2	8.6	6.6	9.8	9.2	10.0	7.4	5.4	5.0	7.0	8.6	-	5.3
Relative Humidity	Max	98	97	97	98	97	90	97	92	94	94	94	95	-	-
	Min	55	53	67	81	79	61	63	70	62	59	68	65	-	-
Soil Temperature at 10 cm	06 UTC	12.4	13.2	12.4	10.8	13.0	11.4	11.2	10.4	9.8	9.2	10.2	11.3	-	8.6
	12 UTC	14.0	14.4	12.8	10.8	10.6	12.8	12.4	11.2	11.2	11.8	11.2	12.1	-	10.2
Sunshine Duration		2.9	8.3	0.5	0.0	1.4	5.2	0.0	1.2	4.1	7.6	3.8	3.2	-	4.8
Precipitation		2.8		40.4	0.1	9.6		19.4	7.2			18.8	98.3	-	33.1
Evaporation		1.0	2.0	1.4	1.0	2.2	3.1	3.5	2.6	1.2	1.6	2.8	22.4	-	18.6
Growing Degrees	5	10.6	11.5	8.2	6.1	7.6	7.6	7.7	4.8	4.4	4.4	4.2	77.1	-	51.2
	10	5.6	6.5	3.2	1.1	2.6	2.6	2.7	0.0	0.0	0.0	0.0	24.3	-	9.9

3rd 10-day period (21-31/01/2009)	Previous Year Value	Past Years Mean Value	
Reference Evapotranspiration	12.1	-	11.9
Precipitation - Reference Evapotranspiration	86.2	-	21.2
Number of Rainy Days	7.0	-	4.6
Number of Dry Days	4.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

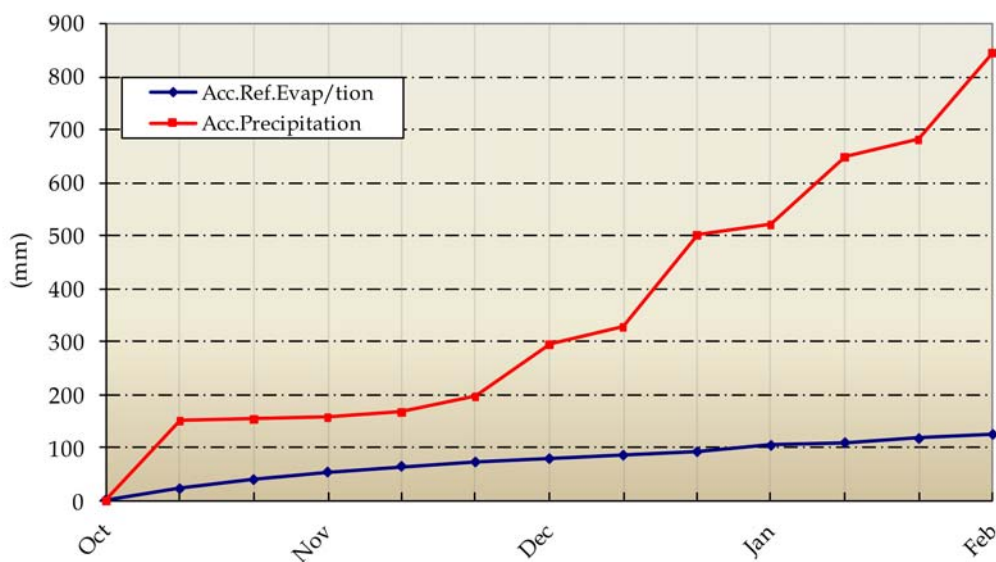


Arta

3rd 10-day period (21-31/01/2009)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	18.8	21.0	13.0	12.2	13.0	16.4	13.2	10.0	16.0	17.2	9.0	14.5	-	14.0
	Min	10.6	12.0	7.4	5.2	9.0	7.8	8.0	6.2	4.2	1.8	5.6	7.1	-	3.5
Relative Humidity	Max	95	94	95	95	96	96	92	94	95	92	94	94	-	-
	Min	55	40	85	94	74	45	70	78	31	18	59	59	-	-
Soil Temperature at 10 cm	06 UTC	10.4	11.4	11.8	10.4	11.2	10.6	11.2	10.2	9.6	9.0	9.8	10.5	-	6.8
	12 UTC	10.8	13.3	11.8	10.8	11.2	11.0	11.2	10.2	10.2	9.4	9.4	10.8	-	8.3
Sunshine Duration		0.9	2.7	0.1	0.0	0.0	5.6	0.0	0.0	6.8	7.8	4.0	2.5	-	4.6
Precipitation		10.6	6.1	33.3	11.9	21.4	16.7	23.9	8.8	0.2	3.0	27.1	163.0	-	38.8
Evaporation		-	-	-	-	0.3	1.0	0.2	0.2	1.2	0.9	1.2	-	-	-
Growing Degrees	5	9.7	11.5	5.2	3.7	6.0	7.1	5.6	3.1	5.1	4.5	2.3	63.8	-	42.3
	10	4.7	6.5	0.2	0.0	1.0	2.1	0.6	0.0	0.1	0.0	0.0	15.2	-	6.6

3rd 10-day period (21-31/01/2009)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	8.0	-	9.6
Precipitation - Reference Evapotranspiration	155.0	-	29.2
Number of Rainy Days	11.0	-	4.0
Number of Dry Days	5.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

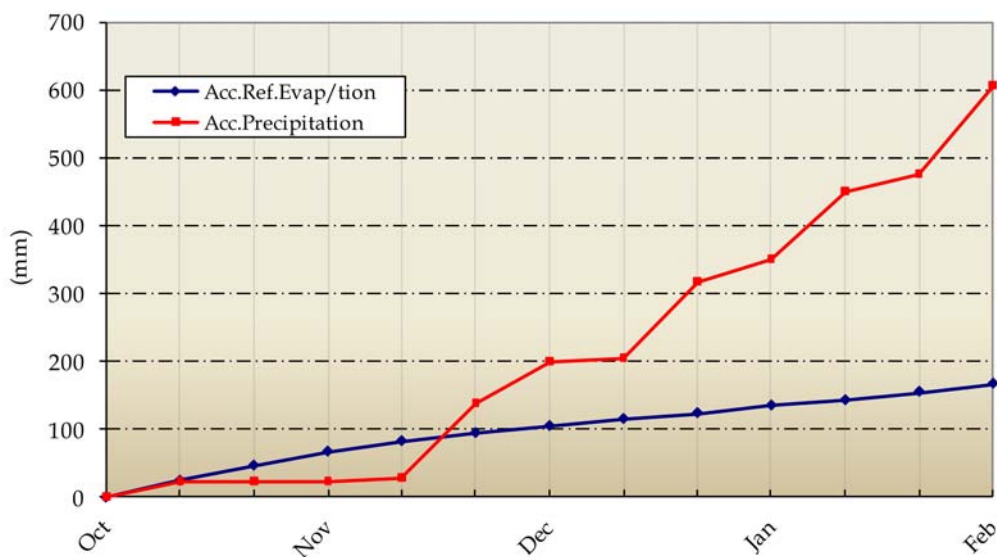


Kalamata

3rd 10-day period (21-31/01/2009)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	18.4	19.6	17.8	13.6	16.0	19.6	17.4	11.8	12.0	17.0	13.0	16.0	-	14.8
	Min	12.8	13.8	9.2	5.8	11.0	10.0	11.4	6.8	4.6	7.0	7.6	9.1	-	5.3
Relative Humidity	Max	89	93	97	97	95	95	95	97	100	97	97	96	-	-
	Min	67	58	76	77	79	55	61	82	76	49	55	67	-	-
Soil Temperature at 10 cm	06 UTC	12.0	13.2	12.8	11.2	12.6	12.0	12.0	11.4	10.6	10.6	10.6	11.7	-	9.0
	12 UTC	12.8	14.0	12.6	11.4	12.6	12.8	12.6	11.4	11.2	10.8	11.0	12.1	-	10.3
Sunshine Duration		5.1	5.1	0.1	0.0	0.4	7.6	1.5	1.5	2.7	8.7	5.1	3.4	-	4.4
Precipitation		1.3		38.1	1.5	27.4	9.8	22.0	16.9	3.2	0.6	11.0	131.8	-	36.5
Evaporation		4.0	3.0	4.3	0.1	0.6	6.0	2.3	0.0	3.7	1.5	0.5	26.0	-	21.4
Growing Degrees	5	10.6	11.7	8.5	4.7	8.5	9.8	9.4	4.3	3.3	7.0	5.3	83.1	-	55.6
	10	5.6	6.7	3.5	0.0	3.5	4.8	4.4	0.0	0.0	2.0	0.3	30.8	-	9.3

3rd 10-day period (21-31/01/2009)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	11.9	-	13.4
Precipitation - Reference Evapotranspiration	119.9	-	23.1
Number of Rainy Days	10.0	-	4.7
Number of Dry Days	1.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

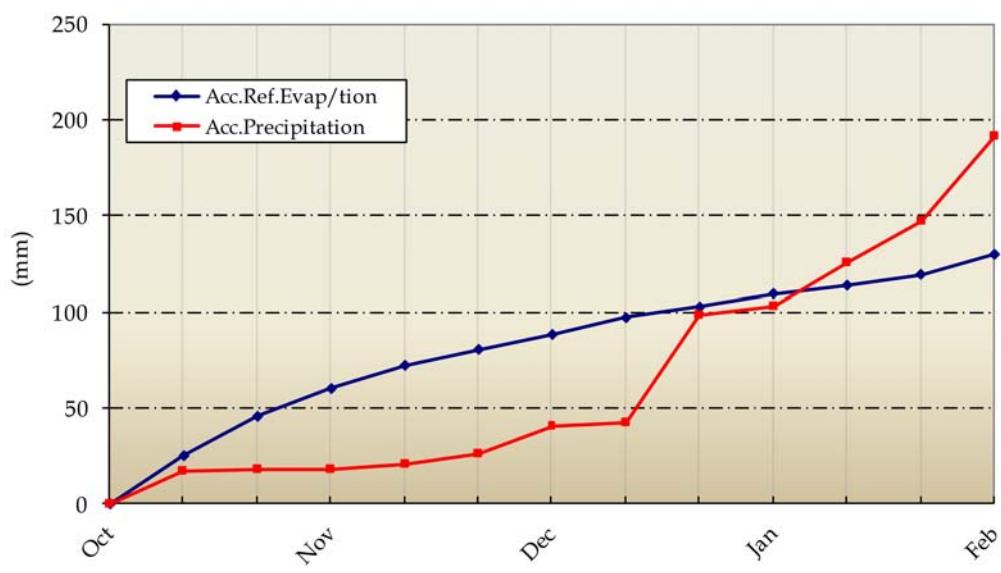


Larisa

3rd 10-day period (21-31/01/2009)		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	18.2	14.8	14.2	13.0	16.8	16.2	14.4	14.0	10.2	8.2	14.0	-	10.7
	Min	8.8	10.0	9.0	2.8	5.6	2.2	4.4	4.4	1.2	3.6	5.4	5.2	-	1.2
Relative Humidity	Max	100	93	97	97	97	94	95	97	96	94	97	96	-	-
	Min	91	67	61	62	76	41	60	50	55	70	85	65	-	-
Soil Temperature at 10 cm	06 UTC	8.2	9.8	10.6	8.6	9.6	8.2	8.4	9.4	8.8	8.4	6.0	8.7	-	5.5
	12 UTC	8.8	10.6	10.8	9.6	9.8	9.0	9.4	9.0	8.4	7.6	7.0	9.1	-	6.2
Sunshine Duration		0.0	4.4	3.3	3.7	1.9	8.1	3.6	5.7	6.1	0.0	0.0	3.3	-	3.5
Precipitation		10.2		9.9		0.6	0.6	6.5	4.9		0.0	11.4	44.1	-	10.7
Evaporation		5.0	2.1	1.6	1.3	0.6	1.6	0.0	6.3	1.5	1.0	4.1	25.1	-	7.0
Growing Degrees	5	6.3	9.1	6.9	3.5	4.3	4.5	5.3	4.4	2.6	1.9	1.8	50.6	-	18.5
	10	1.3	4.1	1.9	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	7.6	-	1.5

3rd 10-day period (21-31/01/2009)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	10.4	-	8.6
Precipitation - Reference Evapotranspiration	33.7	-	2.1
Number of Rainy Days	7.0	-	3.0
Number of Dry Days	6.0	-	-

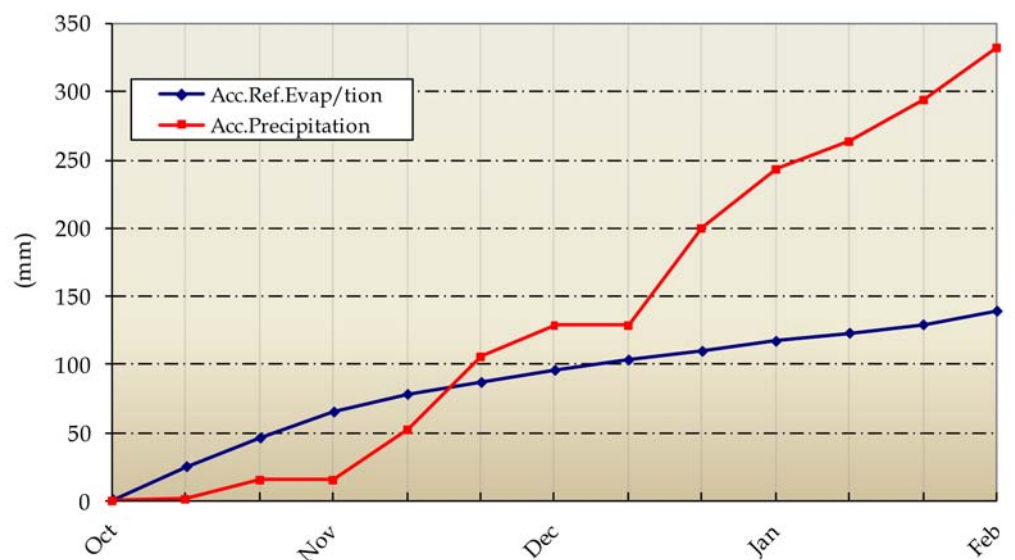
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



3rd 10-day period (21-31/01/2009)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	17.8	18.8	16.4	16.4	18.0	20.4	19.8	16.2	16.6	11.4	12.6	16.8	-	14.0
	Min	11.2	12.4	9.4	3.2	9.8	5.6	4.4	6.4	1.4	5.6	7.6	7.0	-	3.0
Relative Humidity	Max	95	89	92	91	88	94	93	94	96	91	94	92	-	-
	Min	83	78	57	69	85	37	61	52	45	59	80	64	-	-
Soil Temperature at 10 cm	06 UTC	11.2	11.8	11.8	9.2	12.0	9.4	9.4	10.4	8.4	9.4	10.2	10.3	-	6.7
	12 UTC	12.4	13.4	12.4	11.4	12.0	12.4	12.0	12.6	10.8	10.8	10.4	11.9	-	9.8
Sunshine Duration		1.1	0.8	3.8	3.1	2.0	7.9	3.7	3.5	7.0	3.0	2.4	3.5	-	4.2
Precipitation		2.4	0.0	11.9	1.7	1.2	0.2		11.0	0.0		9.9	38.3	-	25.2
Evaporation		0.2	0.3	0.4	1.2	1.0	2.4	1.2	1.8	1.5	0.8	0.7	11.5	-	13.2
Growing Degrees	5	9.5	10.6	7.9	4.8	8.9	8.0	7.1	6.3	4.0	3.5	5.1	75.7	-	39.4
	10	4.5	5.6	2.9	0.0	3.9	3.0	2.1	1.3	0.0	0.0	0.1	23.4	-	5.4

3rd 10-day period (21-31/01/2009)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	10.1	-	10.3
Precipitation - Reference Evapotranspiration	28.2	-	14.9
Number of Rainy Days	7.0	-	3.7
Number of Dry Days	6.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

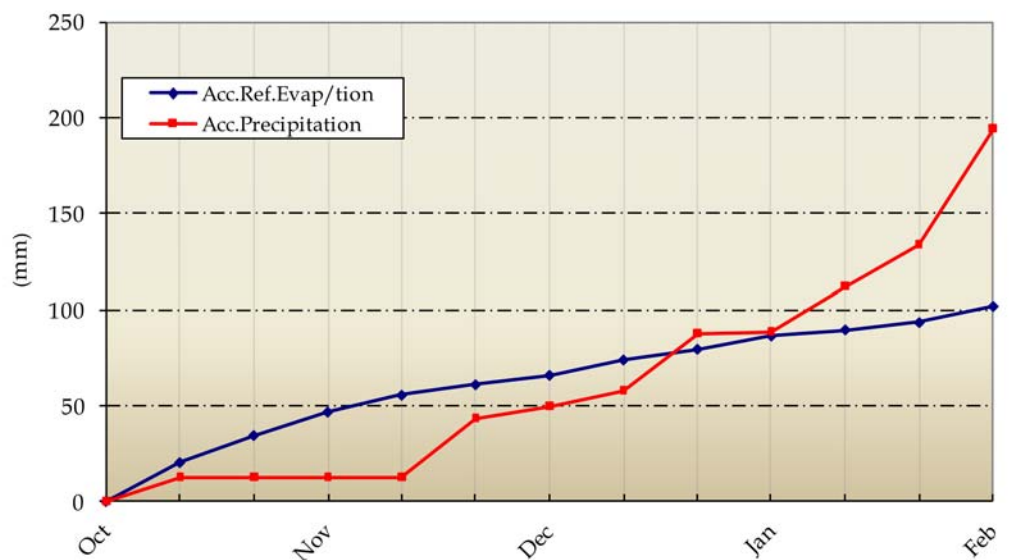


3rd 10-day period (21-31/01/2009)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	13.0	16.4	14.4	12.4	15.6	16.2	11.2	13.0	12.6	12.8	7.4	13.2	-	8.6
	Min	3.0	8.0	9.6	5.2	5.4	5.6	3.8	4.0	1.8	2.8	5.0	4.9	-	0.4
Relative Humidity	Max	97	89	87	94	92	91	93	92	94	94	81	91	-	-
	Min	88	75	64	83	69	43	68	72	63	52	69	68	-	-
Soil Temperature at 10 cm	06 UTC	4.8	7.8	11.0	9.2	9.2	9.2	7.6	9.2	7.8	7.8	7.6	8.3	-	3.9
	12 UTC	5.2	8.4	10.6	9.2	9.6	9.4	7.8	9.6	8.2	7.8	7.8	8.5	-	4.6
Sunshine Duration		0.0	0.2	0.3	1.6	3.5	6.9	1.6	2.2	4.4	6.7	0.0	2.5	-	3.2
Precipitation		9.5	3.4	23.4	1.2	6.2	3.8	2.6	9.8		0.7		60.6	-	11.3
Evaporation		-	-	-	-	-	-	-	-	-	0.8	0.8	-	-	2.9
Growing Degrees	5	3.0	7.2	7.0	3.8	5.5	5.9	2.5	3.5	2.2	2.8	1.2	44.6	-	9.9
	10	0.0	2.2	2.0	0.0	0.5	0.9	0.0	0.0	0.0	0.0	0.0	5.6	-	0.6

Seres

3rd 10-day period (21-31/01/2009)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	8.4	-	6.3
Precipitation - Reference Evapotranspiration	52.2	-	5.0
Number of Rainy Days	9.0	-	3.0
Number of Dry Days	5.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

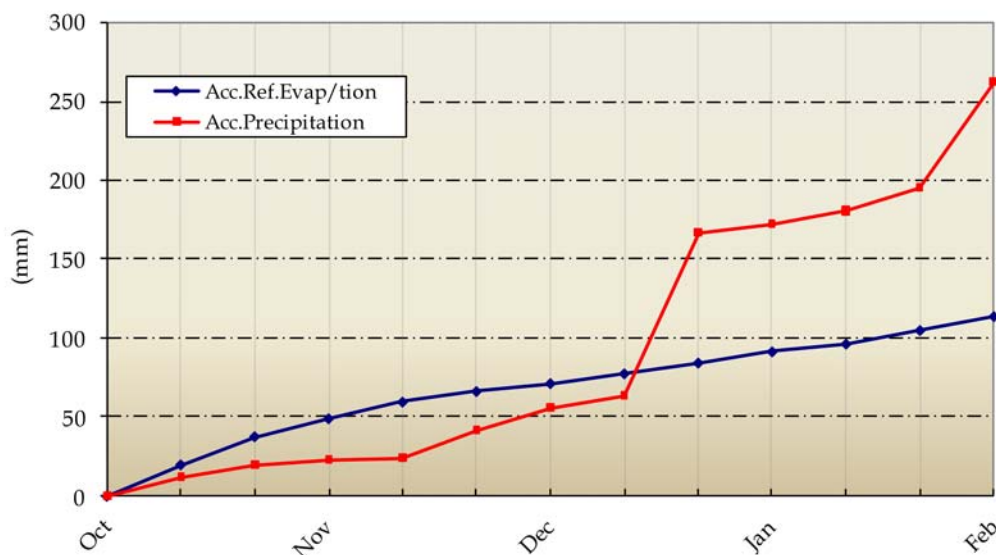


Trikala Imathias

3rd 10-day period (21-31/01/2009)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	10.0	17.2	14.2	15.0	-	18.4	-	-	-	-	6.0	13.5	-	9.2
	Min	8.0	9.4	9.8	5.6	-	4.2	4.8	6.4	3.4	5.2	4.8	6.2	-	0.9
Relative Humidity	Max	89	97	97	-	98	98	98	98	98	98	98	91	-	-
	Min	55	80	84	-	95	46	80	55	55	53	74	68	-	-
Soil Temperature at 10 cm	06 UTC	7.2	8.4	10.2	8.2	-	9.0	8.2	9.0	8.2	8.2	8.0	8.5	-	5.3
	12 UTC	7.4	9.8	10.0	9.6	-	10.0	9.0	10.0	9.0	9.0	7.2	9.1	-	5.5
Sunshine Duration		0.0	3.6	0.1	-	0.6	8.5	2.1	6.7	8.1	4.5	0.0	3.4	-	3.7
Precipitation		9.1		40.6				8.1	5.4			3.5	66.7	-	16.5
Evaporation		0.8	0.1	0.1	-	-	0.6	0.4	0.8	0.6	1.4	0.4	-	-	6.8
Growing Degrees	5	4.0	8.3	7.0	5.3	-	6.3	-	-	-	-	0.4	-	-	13.5
	10	0.0	3.3	2.0	0.3	-	1.3	-	-	-	-	0.0	-	-	0.5

3rd 10-day period (21-31/01/2009)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	8.8	-	8.6
Precipitation - Reference Evapotranspiration	57.9	-	7.9
Number of Rainy Days	5.0	-	3.3
Number of Dry Days	6.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

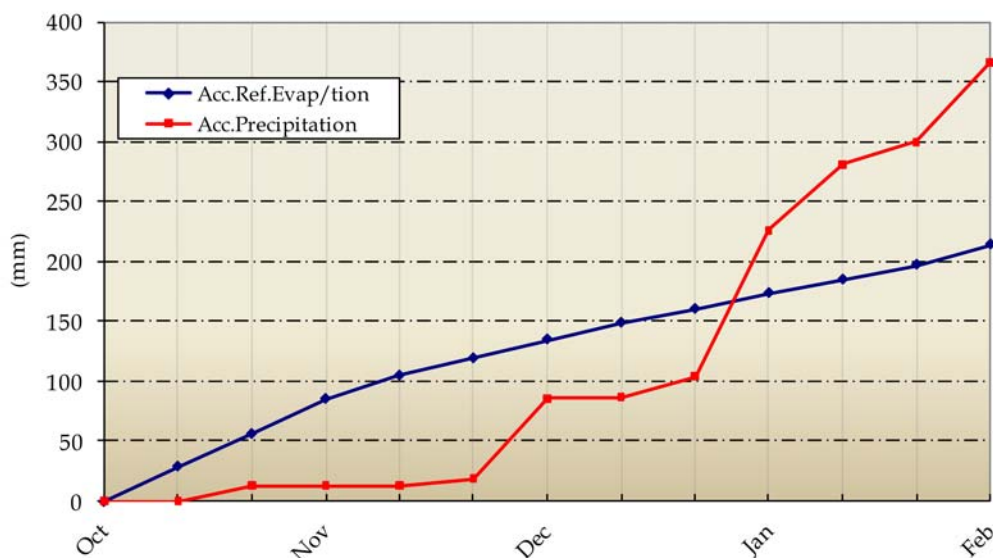


Tympaki

3rd 10-day period (21-31/01/2009)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	18.4	19.0	17.4	17.4	17.4	17.6	19.8	17.4	16.0	15.8	16.0	17.5	-	15.7
	Min	12.4	14.4	12.0	10.8	14.0	12.0	8.4	9.4	8.0	8.2	6.8	10.6	-	7.2
Relative Humidity	Max	96	87	98	96	96	93	96	96	96	92	94	95	-	-
	Min	65	60	50	62	62	60	47	51	65	45	54	56	-	-
Soil Temperature at 10 cm	06 UTC	13.8	13.6	13.8	13.2	15.2	13.4	12.2	13.4	12.0	11.6	10.2	12.9	-	10.5
	12 UTC	15.0	16.0	14.2	14.4	15.6	15.0	15.4	15.6	14.0	12.4	13.6	14.7	-	12.3
Sunshine Duration		0.9	2.4	0.2	0.8	0.0	4.6	0.9	5.4	3.1	5.2	5.7	2.7	-	4.9
Precipitation				7.7	15.7	5.4	3.5		8.3	21.5	4.4	0.2	66.7	-	32.4
Evaporation		3.0	4.4	3.6	1.6	1.7	2.0	2.5	6.6	0.7	0.6	2.8	29.5	-	25.8
Growing Degrees	5	10.4	11.7	9.7	9.1	10.7	9.8	9.1	8.4	7.0	7.0	6.4	99.3	-	70.7
	10	5.4	6.7	4.7	4.1	5.7	4.8	4.1	3.4	2.0	2.0	1.4	44.3	-	18.8

3rd 10-day period (21-31/01/2009)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	16.9	-	16.3
Precipitation - Reference Evapotranspiration	49.8	-	16.1
Number of Rainy Days	8.0	-	3.8
Number of Dry Days	2.0	-	-

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_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.

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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HELLENIC NATIONAL METEOROLOGICAL SERVICE

Division of Climatology-Applications

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The present bulletin was designed and implemented under the support of Water Resources Management Division of Agriculture University of Athens (Professor A. Liakatas)