



AGROMETEOROLOGICAL BULLETIN

March 2011
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



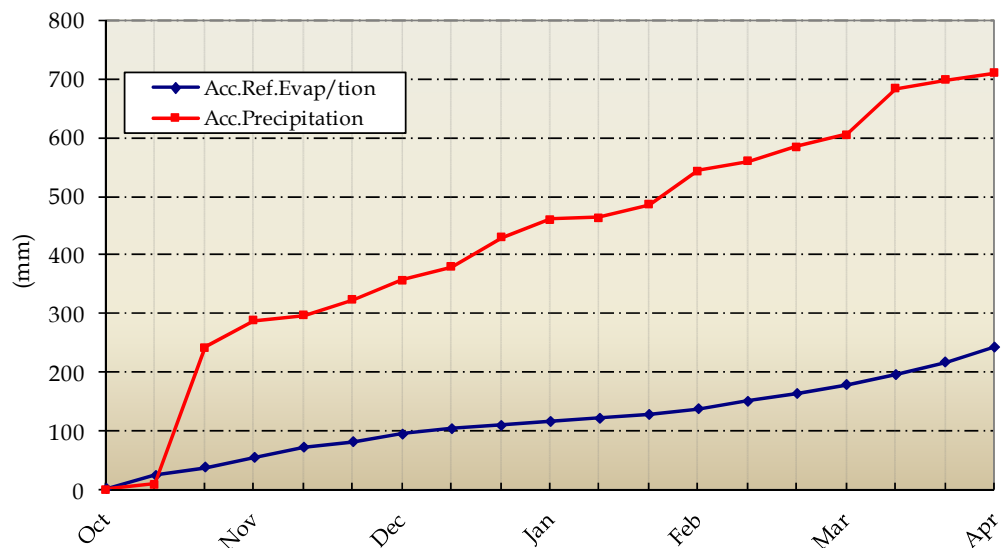
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Web addresses of HNMS
www.hnms.gr
www.emy.gov.gr
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www.meteohellas.gr

3rd 10-day period (21-31/03/2011)		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	16.2	16.3	19.4	20.6	18.2	15.0	21.0	18.4	20.8	18.4	18.3	-	18.4
	Min	9.0	3.8	0.8	3.2	4.0	5.4	7.2	6.4	8.6	4.6	7.4	5.5	-	6.3
Relative Humidity	Max	82	84	96	94	91	100	97	97	98	100	97	94	-	-
	Min	37	30	33	38	38	42	78	49	61	43	61	46	-	-
Soil Temperature at 10 cm	06 UTC	12.0	11.0	10.4	10.2	10.4	11.2	12.0	11.8	13.2	11.6	12.6	11.5	-	10.5
	12 UTC	13.8	12.8	13.0	13.0	13.4	13.4	13.2	14.6	14.0	14.2	14.2	13.6	-	14.3
Sunshine Duration		9.5	10.5	8.6	8.4	10.5	8.2	0.3	8.2	2.3	9.8	1.2	7.0	-	6.1
Precipitation								2.5		6.0		2.7	11.2	-	24.6
Evaporation		4.0	1.3	6.7	3.4	4.8	5.8	1.8	3.1	2.2	2.8	1.5	37.4	-	38.9
Growing Degrees	5	8.2	5.0	3.6	6.3	7.3	6.8	6.1	8.7	8.5	7.7	7.9	76.1	-	80.5
	10	3.2	0.0	0.0	1.3	2.3	1.8	1.1	3.7	3.5	2.7	2.9	22.5	-	29.2

3rd 10-day period (21-31/03/2011)	Previous Year Value	Past Years Mean Value	
Reference Evapotranspiration	25.7	-	26.3
Precipitation - Reference Evapotranspiration	-14.5	-	-1.7
Number of Rainy Days	3.0	-	3.6
Number of Dry Days	7.0	-	-

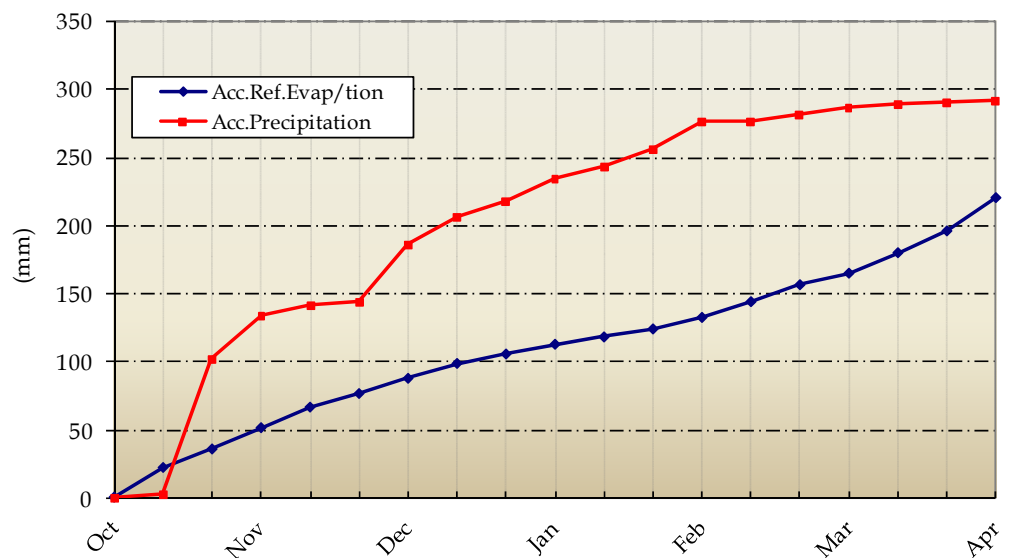
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



3rd 10-day period (21-31/03/2011)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	9.6	11.6	12.4	18.4	16.2	17.6	16.2	17.0	15.4	18.4	17.4	15.5	17.0	14.1
	Min	6.0	5.2	-2.0	6.8	2.4	7.6	12.0	4.4	8.4	7.6	9.6	6.2	7.5	4.9
Relative Humidity	Max	77	73	76	94	96	89	91	95	97	90	97	89	91	-
	Min	54	27	52	34	58	58	74	68	79	58	55	56	53	-
Soil Temperature at 10 cm	06 UTC	7.8	7.2	6.6	8.4	8.8	10.0	13.0	10.5	10.6	11.0	11.6	9.6	10.7	8.3
	12 UTC	8.6	9.0	8.5	10.6	11.2	12.4	13.0	12.6	11.2	14.0	13.8	11.4	12.9	11.0
Sunshine Duration		2.0	10.6	6.5	10.3	10.6	10.3	3.0	8.6	0.1	11.5	4.6	7.1	7.2	5.5
Precipitation		0.0			0.0					0.2	1.6	0.0	1.8	1.7	15.2
Evaporation		1.5	0.0	0.0	5.1	3.1	3.1	2.6	1.4	0.9	2.3	4.5	24.5	36.6	32.3
Growing Degrees	5	2.8	3.4	0.2	7.6	4.3	7.6	9.1	5.7	6.9	8.0	8.5	64.1	79.8	51.2
	10	0.0	0.0	0.0	2.6	0.0	2.6	4.1	0.7	1.9	3.0	3.5	18.4	25.6	11.3

3rd 10-day period (21-31/03/2011)	Previous Year Value	Past Years Mean Value	
Reference Evapotranspiration	24.5	26.4	23.3
Precipitation - Reference Evapotranspiration	-22.7	-24.7	-8.1
Number of Rainy Days	2.0	2.0	2.7
Number of Dry Days	8.0	15.0	-

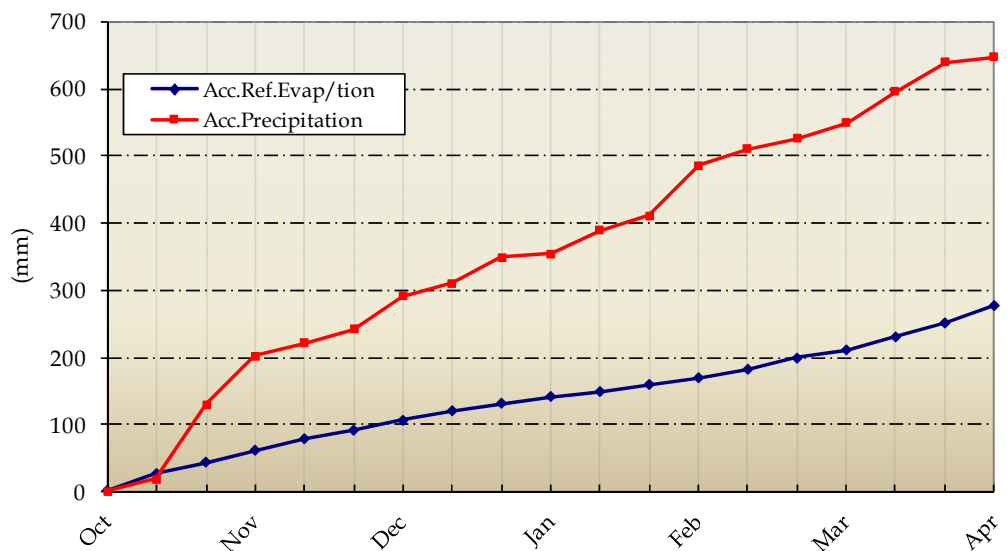
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



3rd 10-day period (21-31/03/2011)		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	15.8	18.4	18.8	18.2	18.0	14.0	19.2	19.4	15.4	17.3	18.3	17.4
	Min	9.6	4.0	1.8	3.6	6.0	7.6	9.4	10.4	11.6	8.6	9.4	7.5	9.1	7.7
Relative Humidity	Max	92	91	89	92	91	94	95	97	93	94	93	93	94	-
	Min	43	37	39	44	49	57	61	60	52	53	65	51	58	-
Soil Temperature at 10 cm	06 UTC	12.4	11.0	9.4	10.0	11.4	12.2	13.8	13.6	14.6	13.8	14.4	12.4	14.1	11.5
	12 UTC	16.2	14.2	13.6	14.2	16.2	17.0	16.6	18.0	16.0	16.2	16.0	15.8	17.5	14.2
Sunshine Duration		4.2	7.5	10.0	10.9	10.1	9.4	1.4	9.2	3.0	8.9	0.0	6.8	7.2	6.8
Precipitation		1.2							1.2	2.1		2.8	7.3	2.3	19.5
Evaporation		2.6	1.0	5.6	5.2	3.5	2.3	3.6	1.9	2.6	3.7	1.1	33.1	32.1	33.3
Growing Degrees	5	8.5	5.0	3.8	6.0	7.4	7.9	8.7	7.2	10.4	9.0	7.4	81.3	95.2	83.1
	10	3.5	0.0	0.0	1.0	2.4	2.9	3.7	2.2	5.4	4.0	2.4	27.5	40.2	30.3

3rd 10-day period (21-31/03/2011)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	26.0	26.7	27.1
Precipitation - Reference Evapotranspiration	-18.7	-24.4	-7.6
Number of Rainy Days	4.0	2.0	3.2
Number of Dry Days	0.0	6.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

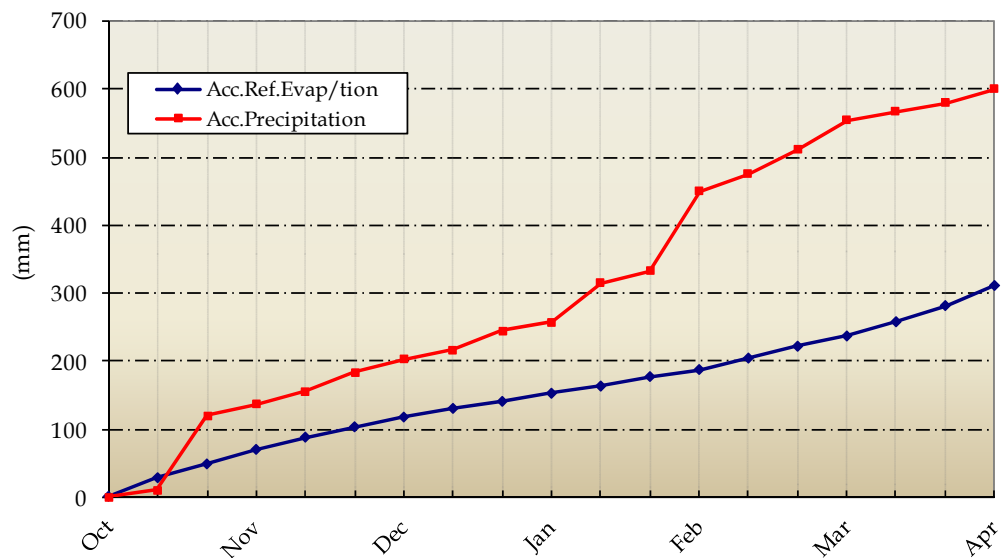


Kalamata

3rd 10-day period (21-31/03/2011)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	17.0	16.8	15.6	19.4	20.2	19.6	17.0	18.6	19.2	21.4	16.0	18.3	18.7	17.8
	Min	9.6	8.6	4.6	3.0	5.4	5.4	5.6	6.4	7.6	7.4	10.0	6.7	8.4	6.9
Relative Humidity	Max	97	80	94	89	92	94	97	100	97	95	98	94	96	-
	Min	49	35	35	36	38	32	67	62	46	42	79	47	56	-
Soil Temperature at 10 cm	06 UTC	13.8	12.0	11.4	11.8	12.0	12.6	12.8	12.4	13.4	13.4	14.0	12.7	14.0	11.8
	12 UTC	14.6	14.4	13.4	13.2	14.2	14.2	14.0	14.6	14.6	15.0	14.0	14.2	15.2	14.2
Sunshine Duration		1.9	8.9	9.6	10.5	11.4	9.8	2.2	11.4	3.9	8.9	0.0	7.1	8.0	6.5
Precipitation		1.6		0.0						0.1		18.0	19.7	16.0	20.1
Evaporation		4.8	4.5	6.4	5.6	2.8	3.6	1.2	9.7	1.9	4.7	0.2	45.4	37.0	37.4
Growing Degrees	5	8.3	7.7	5.1	6.2	7.8	7.5	6.3	7.5	8.4	9.4	8.0	82.2	94.4	81.3
	10	3.3	2.7	0.1	1.2	2.8	2.5	1.3	2.5	3.4	4.4	3.0	27.2	39.4	28.3

3rd 10-day period (21-31/03/2011)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	29.6	29.7	27.8
Precipitation - Reference Evapotranspiration	-9.9	-13.7	-7.7
Number of Rainy Days	3.0	2.0	3.3
Number of Dry Days	0.0	6.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

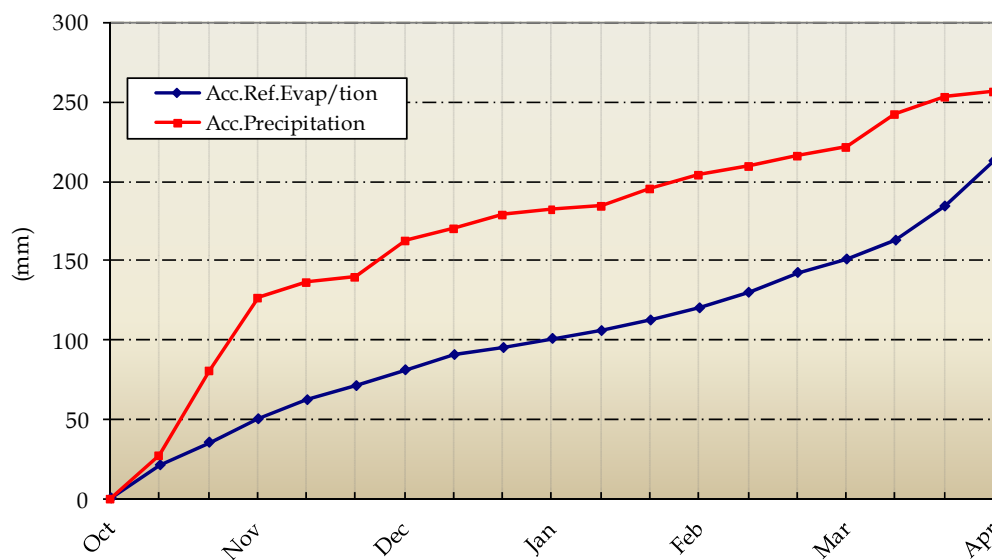


Larisa

3rd 10-day period (21-31/03/2011)		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	12.8	15.2	19.4	21.6	21.8	22.4	22.4	20.6	20.0	14.8	18.3	20.4	16.9
	Min	8.0	7.0	6.8	5.2	2.8	3.4	7.6	4.8	10.0	4.6	10.4	6.4	6.3	4.2
Relative Humidity	Max	88	88	88	91	89	87	85	88	92	97	93	90	93	-
	Min	69	45	38	40	29	28	30	32	41	43	74	43	43	-
Soil Temperature at 10 cm	06 UTC	10.4	10.4	10.0	9.0	10.2	10.4	11.2	10.6	11.6	10.0	12.0	10.5	11.8	10.0
	12 UTC	10.6	10.8	11.0	11.4	12.8	11.6	12.2	12.6	13.4	13.0	9.4	11.7	13.5	11.4
Sunshine Duration		0.0	6.8	8.1	8.5	9.7	9.3	9.1	9.3	3.0	9.2	0.3	6.7	6.9	6.0
Precipitation		0.4	0.0	0.0	0.0					1.5		1.7	3.6	1.0	11.3
Evaporation		0.5	4.7	2.6	3.3	3.2	5.3	4.9	2.7	2.4	4.6	1.7	35.9	34.0	32.5
Growing Degrees	5	4.0	4.9	6.0	7.3	7.2	7.6	10.0	8.6	10.3	7.3	7.6	80.8	92.2	61.7
	10	0.0	0.0	1.0	2.3	2.2	2.6	5.0	3.6	5.3	2.3	2.6	26.9	37.2	16.3

3rd 10-day period (21-31/03/2011)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	28.6	28.7	25.6
Precipitation - Reference Evapotranspiration	-25.0	-27.7	-14.3
Number of Rainy Days	3.0	2.0	3.1
Number of Dry Days	0.0	8.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

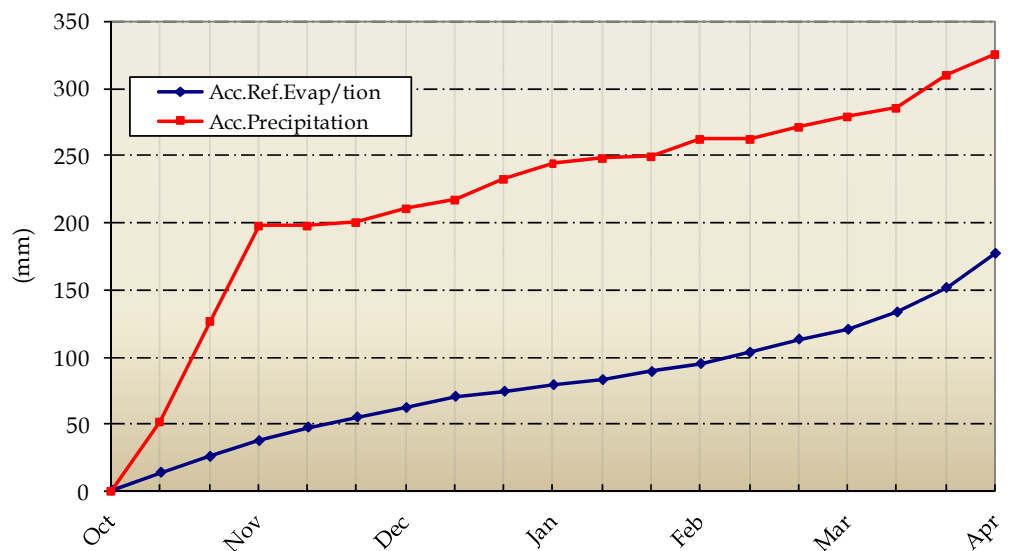


Series

3rd 10-day period (21-31/03/2011)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	12.6	14.8	16.4	20.8	22.8	24.0	23.6	19.6	16.4	20.6	19.2	19.2	19.9	16.7
	Min	7.0	5.4	4.4	7.0	4.8	4.0	6.6	6.0	9.8	8.8	7.4	6.5	6.7	5.3
Relative Humidity	Max	89	91	91	85	85	91	88	92	97	97	90	91	81	-
	Min	54	45	30	31	22	22	22	51	70	41	53	40	45	-
Soil Temperature at 10 cm	06 UTC	11.2	10.2	9.2	10.8	11.0	11.2	12.2	12.4	13.0	12.6	13.2	11.5	11.7	9.4
	12 UTC	12.0	11.2	11.0	12.2	12.0	12.8	13.6	13.4	13.4	14.0	14.4	12.7	13.3	11.6
Sunshine Duration		1.9	5.5	8.4	9.6	10.9	10.7	9.5	7.2	0.1	8.4	5.0	7.0	6.3	5.2
Precipitation										16.1			16.1	1.9	12.8
Evaporation		0.4	2.0	1.5	5.1	3.7	3.8	3.8	1.3	0.7	2.6	0.8	25.7	29.8	24.9
Growing Degrees	5	4.8	5.1	5.4	8.9	8.8	9.0	10.1	7.8	8.1	9.7	8.3	86.0	91.3	66.5
	10	0.0	0.1	0.4	3.9	3.8	4.0	5.1	2.8	3.1	4.7	3.3	31.2	37.0	20.1

3rd 10-day period (21-31/03/2011)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	25.6	26.9	21.5
Precipitation - Reference Evapotranspiration	-9.5	-25.0	-8.7
Number of Rainy Days	1.0	3.0	3.0
Number of Dry Days	8.0	11.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

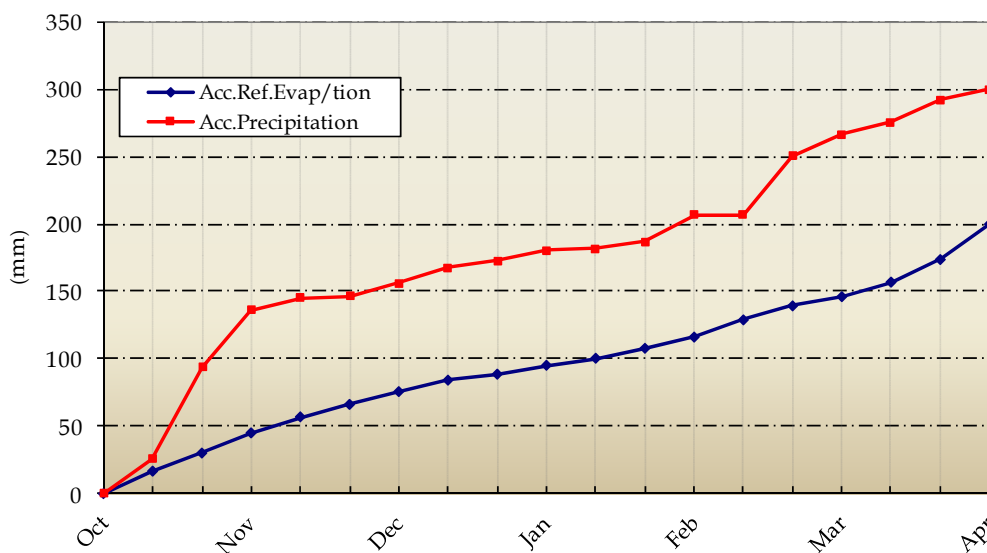


Trikala Imathias

3rd 10-day period (21-31/03/2011)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	11.2	14.6	16.6	22.0	23.0	23.0	23.4	20.6	18.6	21.6	20.0	19.5	21.7	16.5
	Min	7.0	5.4	3.6	7.8	6.0	4.4	6.4	7.4	11.0	7.4	9.2	6.9	8.1	5.7
Relative Humidity	Max	95	98	93	84	100	94	91	98	95	99	100	95	91	-
	Min	71	39	22	28	21	29	19	42	64	28	49	37	36	-
Soil Temperature at 10 cm	06 UTC	11.0	11.0	10.6	10.6	11.0	11.2	12.0	12.4	13.2	12.4	13.2	11.7	12.2	10.0
	12 UTC	11.0	11.2	12.4	12.8	13.0	13.2	14.0	14.4	14.0	14.2	14.4	13.1	14.1	10.8
Sunshine Duration		0.0	4.9	9.8	8.2	10.8	10.0	10.4	9.6	1.1	8.3	3.0	6.9	7.4	5.4
Precipitation		5.3								2.4	0.3		8.0	3.8	15.8
Evaporation		0.8	1.5	1.0	2.0	2.6	3.4	2.6	3.3	1.2	1.9	1.4	21.7	-	25.9
Growing Degrees	5	4.1	5.0	5.1	9.9	9.5	8.7	9.9	9.0	9.8	9.5	9.6	90.1	-	66.5
	10	0.0	0.0	0.1	4.9	4.5	3.7	4.9	4.0	4.8	4.5	4.6	36.0	-	21.0

3rd 10-day period (21-31/03/2011)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	26.2	29.1	23.1
Precipitation - Reference Evapotranspiration	-18.2	-25.3	-7.3
Number of Rainy Days	3.0	2.0	3.0
Number of Dry Days	0.0	12.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

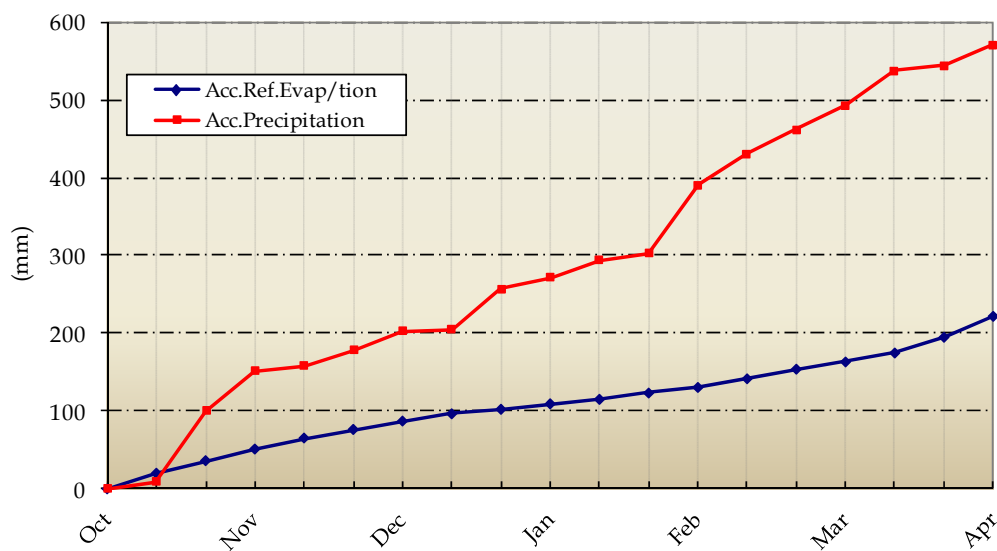


Tripoli

3rd 10-day period (21-31/03/2011)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	9.4	9.0	10.0	14.6	19.6	18.0	15.2	19.2	16.0	18.4	18.0	15.2	-	14.8
	Min	5.4	3.6	-1.4	-1.8	-0.2	-0.4	5.4	4.4	4.2	2.8	8.4	2.8	-	3.1
Relative Humidity	Max	88	74	92	69	92	93	88	94	91	97	97	89	-	-
	Min	67	44	41	33	30	31	55	32	47	44	88	47	-	-
Soil Temperature at 10 cm	06 UTC	8.2	7.2	4.4	5.6	6.2	7.6	9.0	7.8	9.2	8.4	10.0	7.6	-	7.9
	12 UTC	10.4	9.8	10.2	10.8	13.0	13.2	12.8	14.6	14.3	15.2	11.6	12.4	-	9.5
Sunshine Duration		5.2	8.1	9.1	8.5	10.4	10.1	6.8	9.5	4.7	9.0	0.0	7.4	-	6.3
Precipitation		0.2						0.0		2.7		24.6	27.5	-	22.9
Evaporation		3.0	0.0	0.0	8.0	2.0	4.0	2.0	3.0	0.5	3.2	0.8	26.5	-	26.8
Growing Degrees	5	2.4	1.3	0.0	1.4	4.7	3.8	5.3	6.8	5.1	5.6	8.2	44.6	-	45.6
	10	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.8	0.1	0.6	3.2	6.0	-	7.9

3rd 10-day period (21-31/03/2011)	Previous Year Value	Past Years Mean Value	
Reference Evapotranspiration	27.0	-	25.6
Precipitation - Reference Evapotranspiration	0.5	-	-2.7
Number of Rainy Days	3.0	-	3.9
Number of Dry Days	0.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

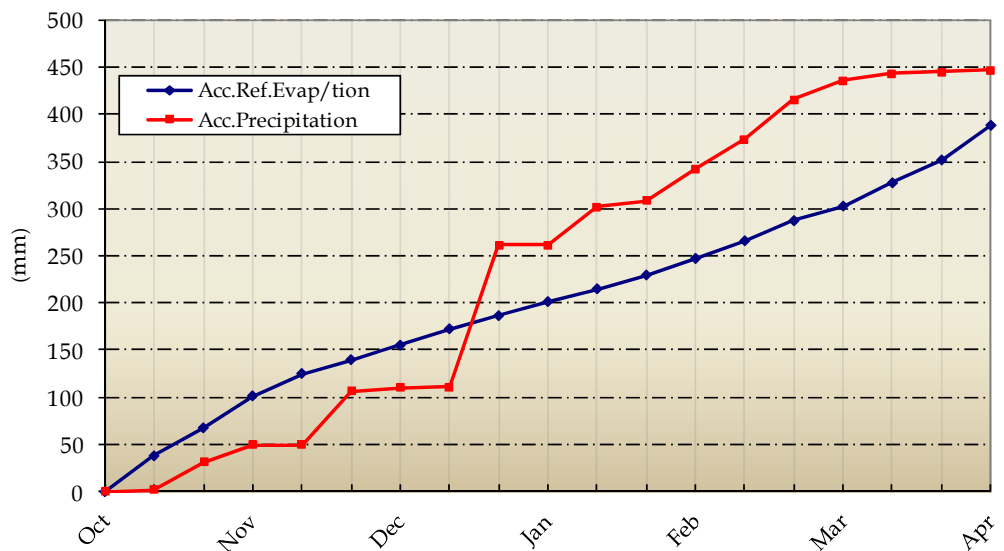


Tympaki

3rd 10-day period (21-31/03/2011)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	18.2	15.0	14.4	18.4	20.8	17.8	18.6	18.2	19.8	25.0	22.6	19.0	20.2	18.4
	Min	8.4	11.0	10.4	9.2	7.4	6.4	8.4	9.0	7.4	10.0	15.2	9.3	9.0	8.9
Relative Humidity	Max	96	79	52	80	82	100	100	100	96	93	91	88	97	-
	Min	38	40	35	30	29	48	61	65	29	27	26	39	44	-
Soil Temperature at 10 cm	06 UTC	14.8	14.6	13.6	13.4	13.0	14.0	15.4	15.4	16.0	15.6	18.8	15.0	16.3	14.3
	12 UTC	19.2	17.0	17.0	16.4	18.8	19.2	19.8	20.6	21.0	22.4	18.8	19.1	21.8	17.1
Sunshine Duration		5.5	9.9	10.8	7.5	10.6	9.7	6.0	10.1	10.1	8.7	0.6	8.1	7.5	7.3
Precipitation		1.1			0.8							0.6	2.5	0.2	10.6
Evaporation		4.1	7.5	8.5	3.9	2.5	5.7	4.9	4.2	4.6	6.1	4.0	56.0	56.7	46.0
Growing Degrees	5	8.3	8.0	7.4	8.8	9.1	7.1	8.5	8.6	8.6	12.5	13.9	100.8	105.5	95.2
	10	3.3	3.0	2.4	3.8	4.1	2.1	3.5	3.6	3.6	7.5	8.9	45.8	50.5	40.5

3rd 10-day period (21-31/03/2011)	Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	36.8	33.1
Precipitation - Reference Evapotranspiration	-34.3	-32.9
Number of Rainy Days	3.0	1.0
Number of Dry Days	2.0	9.0

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.

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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ΥΠΗΡΕΣΙΑ**

HELLENIC NATIONAL METEOROLOGICAL SERVICE

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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)