



AGROMETEOROLOGICAL BULLETIN

March 2013
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



Hellenic National Meteorological Service
Division of Climatology-Applications
El. Venizelou Street 14, 16777
Helliniko, Athens

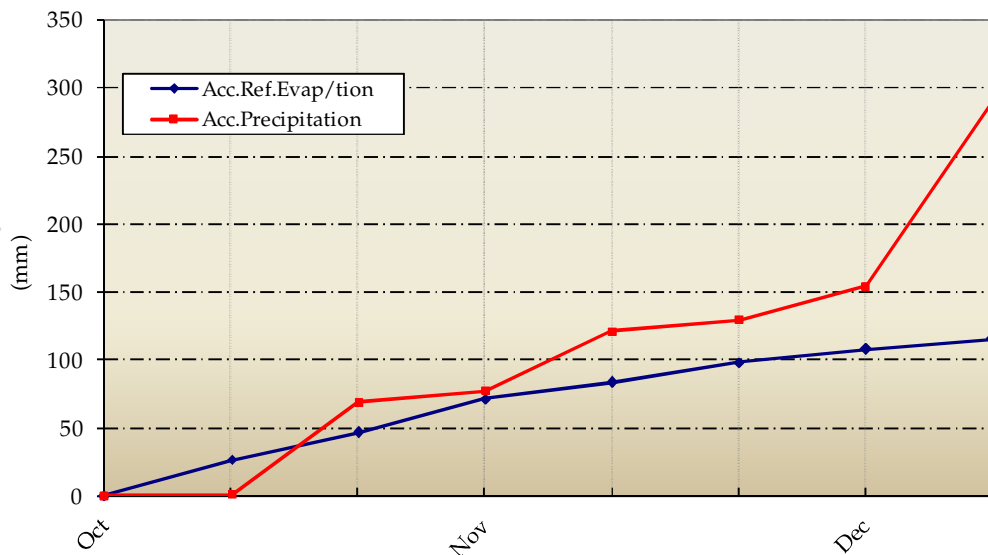
Web addresses of HNMS
www.hnms.gr
www.emy.gov.gr
www.meteo.gov.gr
www.meteohellas.gr

Agrinio

3rd 10-day period (21-31/03/2013)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	-	-	-	-	-	-	-	-	-	-	-		22.4	18.4
	Min	10.0	10.0	-	-	-	10.8	11.8	11.8	8.8	-	-	10.5	6.6	6.3
Relative Humidity	Max	88	-	-	-	93	95	91	95	-	-	98	93	88	-
	Min	53	-	-	-	38	74	71	68	-	-	80	64	37	-
Soil Temperature at 10 cm	06 UTC	11.8	12.4	-	-	-	12.8	13.6	13.6	13.4	-	-	12.9	13.0	10.5
	12 UTC	14.8	-	-	-	-	14.2	14.8	14.0	15.0	-	-	14.6	15.5	14.3
Sunshine Duration		4.6	-	-	-	-	0.0	1.9	6.8	-	-	-	3.3	8.9	6.1
Precipitation							15.8	4.3	6.7					6.0	24.6
Evaporation		2.4	-	-	-	3.3	2.1	1.4	2.0	-	-	2.2	-	44.2	38.9
Growing Degrees	5	-	-	-	-	-	-	-	-	-	-	-	-	104.7	80.5
	10	-	-	-	-	-	-	-	-	-	-	-	-	49.7	29.2

3rd 10-day period (21-31/03/2013)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	-	32.2	26.3
Precipitation - Reference Evapotranspiration	-	-26.2	-1.7
Number of Rainy Days	3.0	1.0	3.6
Number of Dry Days	10.0	13.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

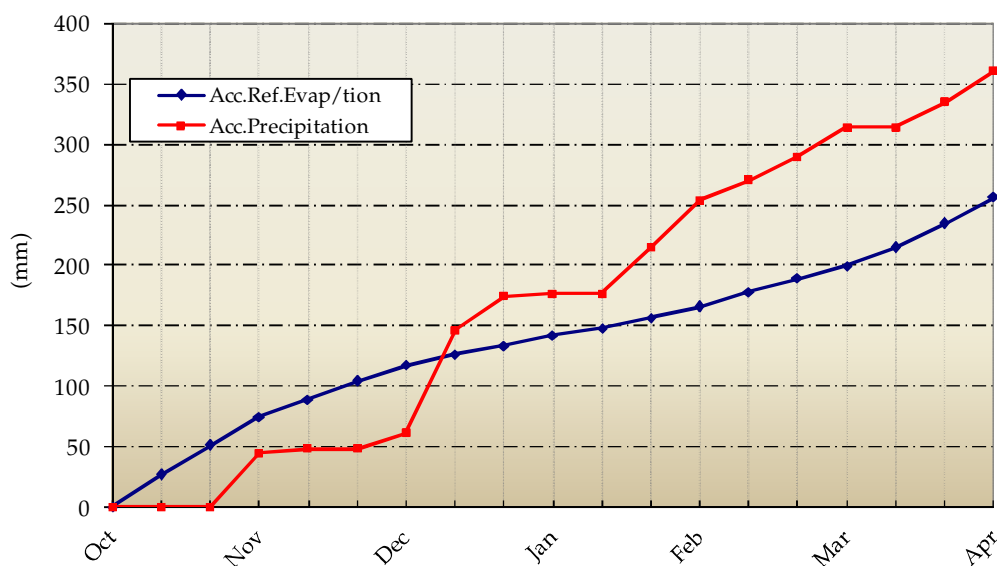


This station is not fully operated

3rd 10-day period (21-31/03/2013)		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	15.8	14.0	14.8	14.0	16.4	12.2	12.2	11.8	15.6	19.2	14.9	17.9	14.1
	Min	8.0	5.6	2.6	4.2	7.0	9.4	7.6	6.4	5.8	5.8	11.6	6.7	4.8	4.9
Relative Humidity	Max	83	97	86	84	85	95	95	85	92	94	91	90	89	-
	Min	55	62	39	54	55	73	61	52	68	66	59	59	43	-
Soil Temperature at 10 cm	06 UTC	11.6	12.2	8.4	8.4	10.4	11.0	11.2	9.6	10.4	10.0	12.2	10.5	10.8	8.3
	12 UTC	14.6	11.6	12.6	13.0	12.4	14.2	13.2	12.2	12.4	14.4	16.0	13.3	13.6	11.0
Sunshine Duration		4.4	0.2	10.5	9.2	2.0	4.0	3.8	6.3	0.5	7.0	2.1	4.5	9.2	5.5
Precipitation		0.0	23.2				1.0	1.6		0.0			25.8	7.2	15.2
Evaporation		3.0	2.0	3.2	1.0	3.4	-	0.1	2.5	3.0	0.2	2.6	-	-	32.3
Growing Degrees	5	7.9	5.7	3.3	4.5	5.5	7.9	4.9	4.3	3.8	5.7	10.4	63.9	69.6	51.2
	10	2.9	0.7	0.0	0.0	0.5	2.9	0.0	0.0	0.0	0.7	5.4	13.1	14.9	11.3

3rd 10-day period (21-31/03/2013)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	21.7	27.5	23.3
Precipitation - Reference Evapotranspiration	4.1	-20.3	-8.1
Number of Rainy Days	3.0	2.0	2.7
Number of Dry Days	2.0	10.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

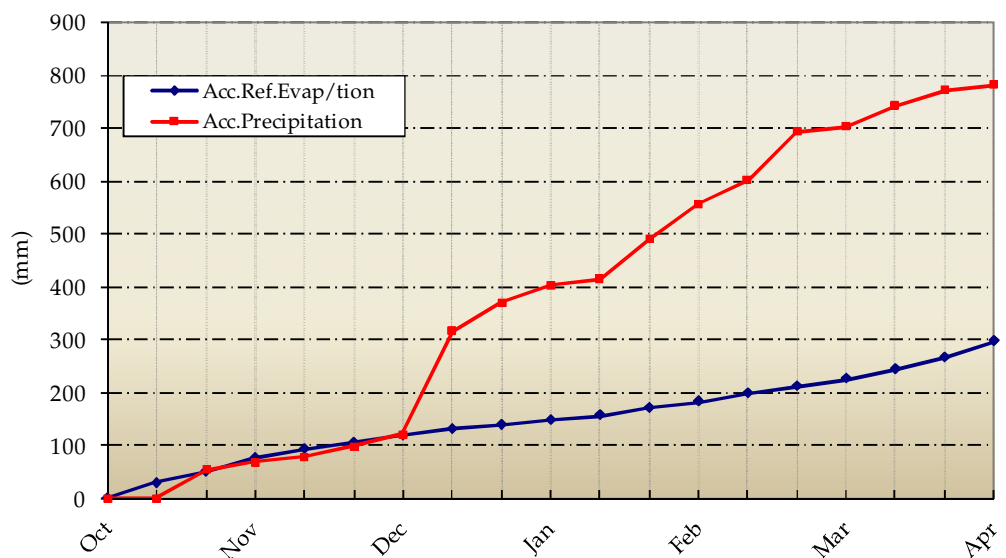


Andravida

3rd 10-day period (21-31/03/2013)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	21.2	15.4	16.4	19.2	21.8	16.4	19.0	21.0	22.6	25.6	18.6	19.7	19.5	17.4
	Min	11.3	11.8	5.9	4.0	8.5	12.0	12.0	11.4	8.9	10.8	12.2	9.9	7.2	7.7
Relative Humidity	Max	86	69	85	86	82	91	89	90	89	88	91	86	99	-
	Min	54	43	46	38	31	60	66	38	48	36	64	48	56	-
Soil Temperature at 10 cm	06 UTC	14.4	13.6	12.2	12.6	13.4	14.0	14.6	15.4	14.8	15.4	15.6	14.2	13.8	11.5
	12 UTC	17.2	17.2	16.8	16.2	16.0	16.4	17.8	18.0	18.0	19.2	16.6	17.2	17.6	14.2
Sunshine Duration		5.4	9.7	10.9	10.3	0.5	4.9	5.9	8.4	6.1	9.3	2.3	6.7	9.0	6.8
Precipitation			0.2				9.8		0.9			0.1	11.0		19.5
Evaporation		2.2	9.0	2.7	4.7	-	4.4	3.4	2.5	1.6	12.6	4.1	-	36.4	33.3
Growing Degrees	5	11.3	8.6	6.2	6.6	10.2	9.2	10.5	11.2	10.8	13.2	10.4	108.0	91.8	83.1
	10	6.3	3.6	1.2	1.6	5.2	4.2	5.5	6.2	5.8	8.2	5.4	53.0	37.2	30.3

3rd 10-day period (21-31/03/2013)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	31.3	28.5	27.1
Precipitation - Reference Evapotranspiration	-20.3	-28.5	-7.6
Number of Rainy Days	4.0	0.0	3.2
Number of Dry Days	5.0	19.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

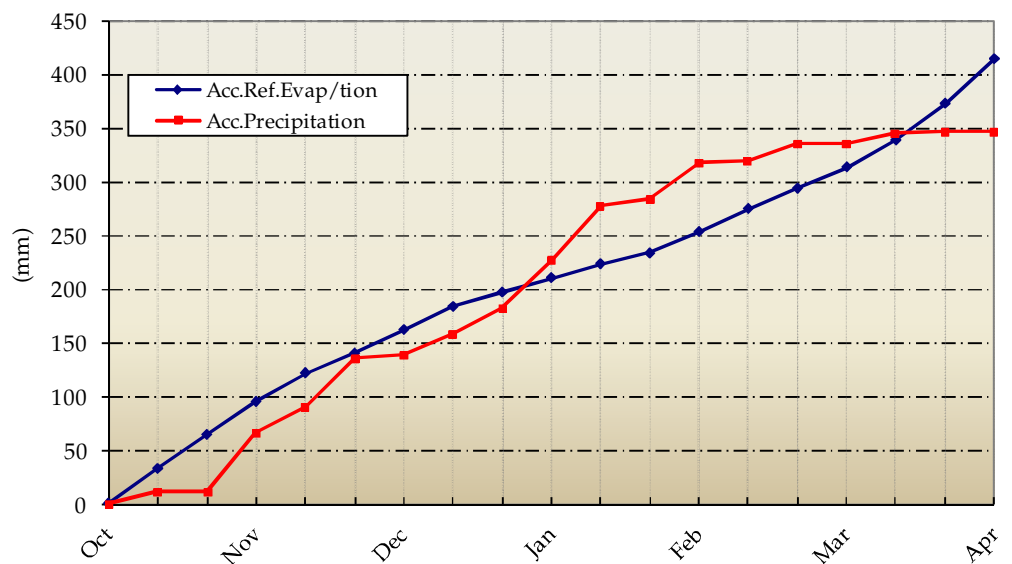


Iraklio

3rd 10-day period (21-31/03/2013)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	24.0	17.6	17.6	22.5	21.4	19.0	19.8	21.6	25.4	24.4	22.2	21.4	-	17.7
	Min	17.4	14.0	12.6	7.8	13.2	14.6	12.0	11.8	11.4	15.4	15.2	13.2	-	10.5
Relative Humidity	Max	81	81	71	72	72	89	85	86	81	73	87	80	-	-
	Min	39	37	46	39	39	57	52	43	34	31	34	41	-	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sunshine Duration		4.2	9.2	9.3	10.0	0.0	5.9	10.0	6.4	10.0	2.1	7.9	6.8	-	6.6
Precipitation														-	15.8
Evaporation		1.1	6.8	4.2	3.6	4.3	3.5	2.0	4.3	3.5	6.1	3.4	42.8	-	48.5
Growing Degrees	5	15.7	10.8	10.1	10.2	12.3	11.8	10.9	11.7	13.4	14.9	13.7	135.5	-	100.1
	10	10.7	5.8	5.1	5.2	7.3	6.8	5.9	6.7	8.4	9.9	8.7	80.5	-	45.5

3rd 10-day period (21-31/03/2013)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	41.4	-	-
Precipitation - Reference Evapotranspiration	-41.4	-	15.8
Number of Rainy Days	0.0	-	3.0
Number of Dry Days	14.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

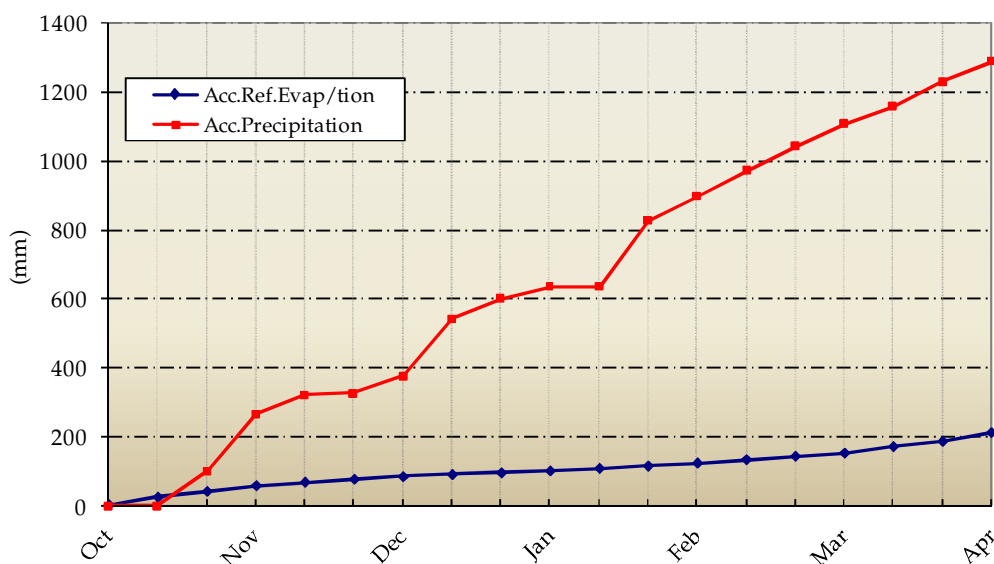


Ioannina

3rd 10-day period (21-31/03/2013)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	16.0	12.6	15.9	18.2	19.0	10.8	16.2	12.6	19.0	22.6	16.6	16.3	20.2	15.1
	Min	5.4	5.3	-2.6	-0.1	6.8	7.7	8.1	8.2	5.8	6.1	11.8	5.7	3.7	4.4
Relative Humidity	Max	94	92	92	96	93	98	96	97	98	98	90	95	86	-
	Min	48	17	20	24	19	61	40	75	41	26	55	39	30	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-	7.9
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-	10.5
Sunshine Duration		6.2	-	8.5	8.8	6.6	0.8	1.2	2.9	0.0	1.3	1.4	3.8	7.1	4.7
Precipitation		6.0	0.1			6.6	26.6	8.1	2.1	0.6	0.0	7.6	57.7		32.3
Evaporation		-	-	-	-	-	-	-	-	-	-	-	-	-	28.9
Growing Degrees	5	5.7	4.0	1.7	4.1	7.9	4.3	7.2	5.4	7.4	9.4	9.2	66.0	76.2	50.7
	10	0.7	0.0	0.0	0.0	2.9	0.0	2.2	0.4	2.4	4.4	4.2	17.1	21.4	11.1

3rd 10-day period (21-31/03/2013)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	24.9	28.0	22.4
Precipitation - Reference Evapotranspiration	32.8	-28.0	9.9
Number of Rainy Days	8.0	0.0	3.9
Number of Dry Days	2.0	20.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

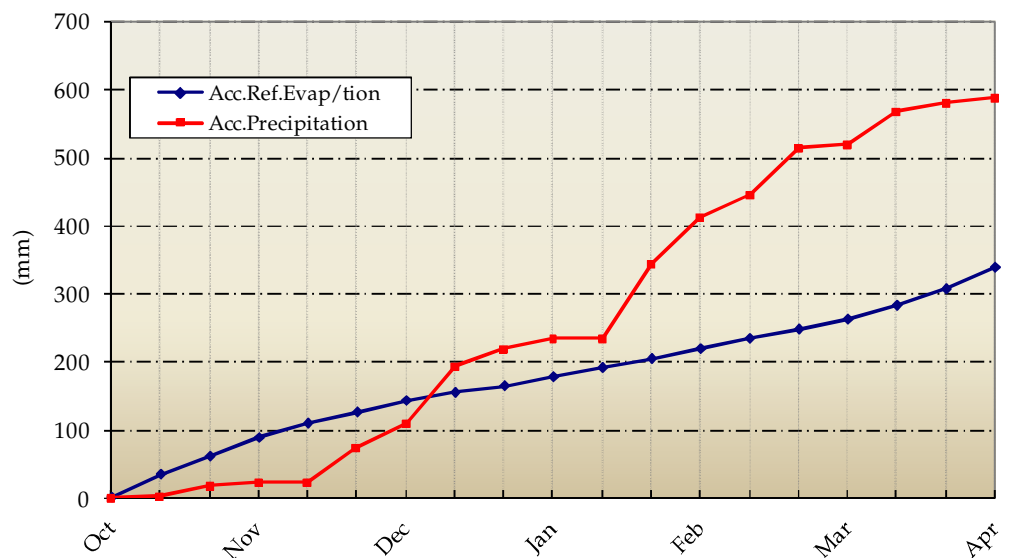


Kalamata

3rd 10-day period (21-31/03/2013)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	20.4	17.4	18.3	17.9	20.6	18.1	19.4	21.4	24.0	22.4	19.8	20.0	20.5	17.8
	Min	13.3	10.5	5.4	3.3	8.3	11.8	9.8	8.9	9.9	10.7	9.7	9.2	6.6	6.9
Relative Humidity	Max	85	82	87	91	86	93	94	95	88	85	94	89	92	-
	Min	51	36	31	50	41	57	60	42	38	43	56	46	41	-
Soil Temperature at 10 cm	06 UTC	14.2	14.0	12.6	12.4	12.8	13.4	13.6	13.6	14.4	14.6	15.0	13.7	12.7	11.8
	12 UTC	14.6	14.6	14.6	14.8	14.0	14.0	14.4	15.0	15.4	16.0	16.4	14.9	14.9	14.2
Sunshine Duration		2.3	10.8	10.8	9.0	1.3	3.0	4.9	10.5	7.3	4.4	0.1	5.9	9.6	6.5
Precipitation		0.0	0.8				8.1						8.9	0.6	20.1
Evaporation		7.2	5.6	4.8	4.2	4.9	1.9	0.2	6.0	2.8	3.2	3.4	44.2	47.0	37.4
Growing Degrees	5	11.9	9.0	6.9	5.6	9.5	10.0	9.6	10.2	12.0	11.6	9.8	105.7	94.1	81.3
	10	6.9	4.0	1.9	0.6	4.5	5.0	4.6	5.2	7.0	6.6	4.8	50.7	39.1	28.3

3rd 10-day period (21-31/03/2013)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	31.6	35.6	27.8
Precipitation - Reference Evapotranspiration	-22.7	-35.0	-7.7
Number of Rainy Days	2.0	2.0	3.3
Number of Dry Days	3.0	13.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

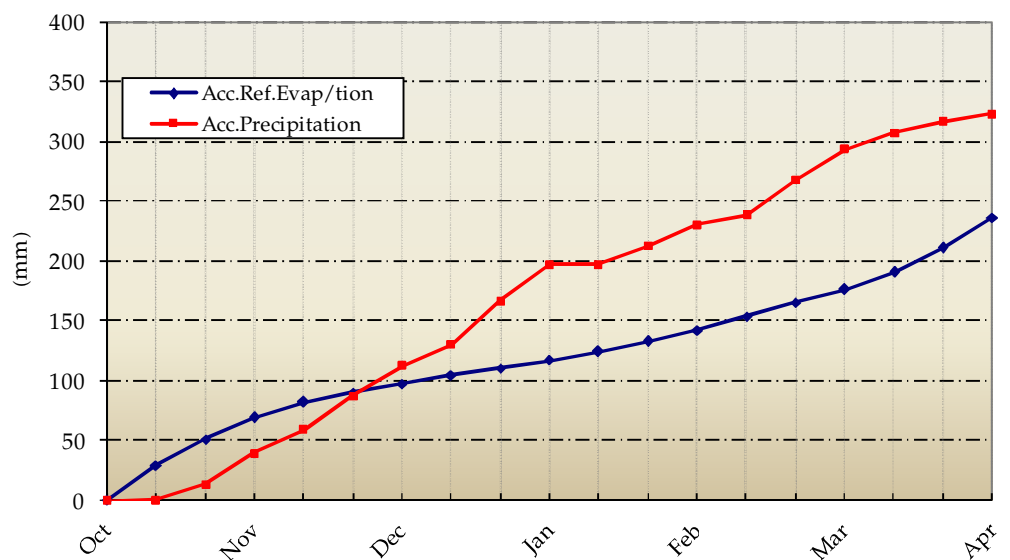


Larisa

3rd 10-day period (21-31/03/2013)		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	17.2	17.6	17.2	16.8	19.3	18.6	16.2	15.2	17.8	16.8	17.4	22.0	16.9
	Min	5.8	8.8	1.6	1.2	5.2	9.4	5.2	8.0	11.2	11.4	6.8	6.8	4.8	4.2
Relative Humidity	Max	100	58	75	92	97	87	92	94	94	99	100	90	83	-
	Min	49	17	24	51	56	42	54	66	76	68	78	53	27	-
Soil Temperature at 10 cm	06 UTC	10.8	11.2	10.0	10.0	11.2	11.8	11.4	12.2	12.8	13.4	13.0	11.6	11.5	10.0
	12 UTC	13.2	12.2	12.0	12.2	12.6	13.8	12.8	12.2	13.8	14.6	13.8	13.0	14.0	11.4
Sunshine Duration		5.0	9.8	10.4	8.2	0.8	5.6	2.2	1.5	0.8	2.7	0.2	4.3	8.8	6.0
Precipitation		4.3	1.7					0.3		0.0		0.4	6.7		11.3
Evaporation		2.9	5.8	5.4	2.0	7.6	12.6	1.4	2.9	1.6	2.6	1.0	45.8	59.0	32.5
Growing Degrees	5	7.0	8.0	4.6	4.2	6.0	9.4	6.9	7.1	8.2	9.6	6.8	77.8	92.6	61.7
	10	2.0	3.0	0.0	0.0	1.0	4.4	1.9	2.1	3.2	4.6	1.8	24.0	37.6	16.3

3rd 10-day period (21-31/03/2013)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	25.5	35.7	25.6
Precipitation - Reference Evapotranspiration	-18.8	-35.7	-14.3
Number of Rainy Days	4.0	0.0	3.1
Number of Dry Days	2.0	18.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

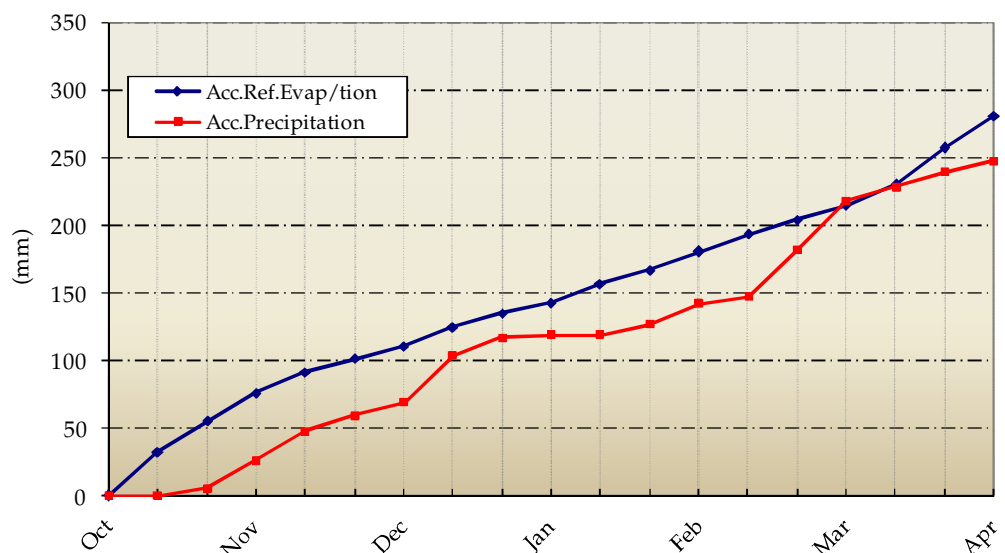


Mikra

3rd 10-day period (21-31/03/2013)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	16.4	14.0	16.0	15.4	17.0	18.4	16.0	14.4	13.2	14.2	16.6	15.6	21.0	16.0
	Min	8.6	9.5	8.5	2.9	7.8	11.0	6.4	10.6	11.0	11.0	9.2	8.8	6.8	5.7
Relative Humidity	Max	92	60	71	80	89	85	87	89	86	91	94	84	78	-
	Min	60	28	27	40	61	48	66	63	72	80	76	56	28	-
Soil Temperature at 10 cm	06 UTC	11.6	10.8	9.2	9.2	11.2	12.0	11.8	12.6	12.2	12.8	12.4	11.4	11.9	9.6
	12 UTC	11.8	12.4	11.6	11.2	12.4	14.0	14.4	13.0	13.0	13.3	12.8	12.7	14.9	12.9
Sunshine Duration		3.5	10.2	10.5	7.2	1.1	5.4	3.0	0.0	0.0	0.0	0.0	3.7	8.9	5.4
Precipitation		3.3	0.1				2.3	1.6		0.3		1.1	8.7		11.2
Evaporation		3.8	7.4	4.0	6.4	3.4	1.9	2.0	0.4	0.1	0.1	1.1	30.6	52.6	35.2
Growing Degrees	5	7.5	6.8	7.3	4.2	7.4	9.7	6.2	7.5	7.1	7.6	7.9	79.1	97.8	64.3
	10	2.5	1.8	2.3	0.0	2.4	4.7	1.2	2.5	2.1	2.6	2.9	24.9	42.8	17.2

3rd 10-day period (21-31/03/2013)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	24.2	36.2	25.7
Precipitation - Reference Evapotranspiration	-15.5	-36.2	-14.5
Number of Rainy Days	6.0	0.0	2.7
Number of Dry Days	2.0	19.0	-

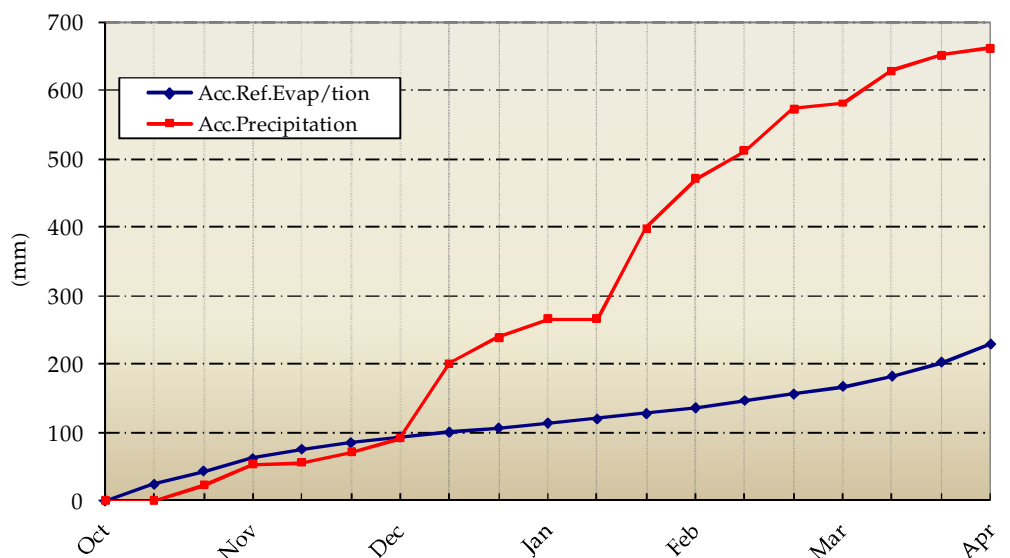
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



3rd 10-day period (21-31/03/2013)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	17.3	12.9	16.2	18.6	17.1	13.2	14.6	18.0	20.1	22.2	15.9	16.9	18.2	14.8
	Min	7.9	6.7	-1.2	-0.9	2.8	8.5	8.4	5.5	4.0	8.1	10.1	5.4	1.8	3.1
Relative Humidity	Max	74	55	77	80	81	78	83	91	96	98	62	80	87	-
	Min	48	26	22	29	39	65	58	49	44	26	44	41	50	-
Soil Temperature at 10 cm	06 UTC	10.8	9.4	7.0	7.8	9.4	10.2	10.2	9.4	10.0	12.0	12.4	9.9	8.8	7.9
	12 UTC	13.0	13.4	13.4	13.8	12.8	12.0	12.2	14.0	14.8	16.4	15.0	13.7	-	9.5
Sunshine Duration		1.8	10.9	10.9	9.9	1.2	3.4	5.3	8.9	8.3	6.3	2.3	6.3	7.7	6.3
Precipitation		0.5	0.0				8.8	0.2	0.0		0.0		9.5	5.1	22.9
Evaporation		3.0	2.9	3.7	2.7	1.6	1.3	0.4	2.9	1.8	2.9	3.2	26.4	-	26.8
Growing Degrees	5	7.6	4.8	2.5	3.9	5.0	5.9	6.5	6.8	7.1	10.2	8.0	68.0	54.9	45.6
	10	2.6	0.0	0.0	0.0	0.0	0.9	1.5	1.8	2.1	5.2	3.0	16.9	4.7	7.9

3rd 10-day period (21-31/03/2013)	Previous Year Value	Past Years Mean Value	
Reference Evapotranspiration	26.7	26.4	25.6
Precipitation - Reference Evapotranspiration	-17.2	-21.3	-2.7
Number of Rainy Days	3.0	2.0	3.9
Number of Dry Days	4.0	11.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration





◆ List of Symbols and Abbreviations

Reference Evapotranspiration ET_0 (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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