



AGROMETEOROLOGICAL BULLETIN

*May 2011
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



Hellenic National Meteorological Service
Division of Climatology-Applications
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Helliniko, Athens

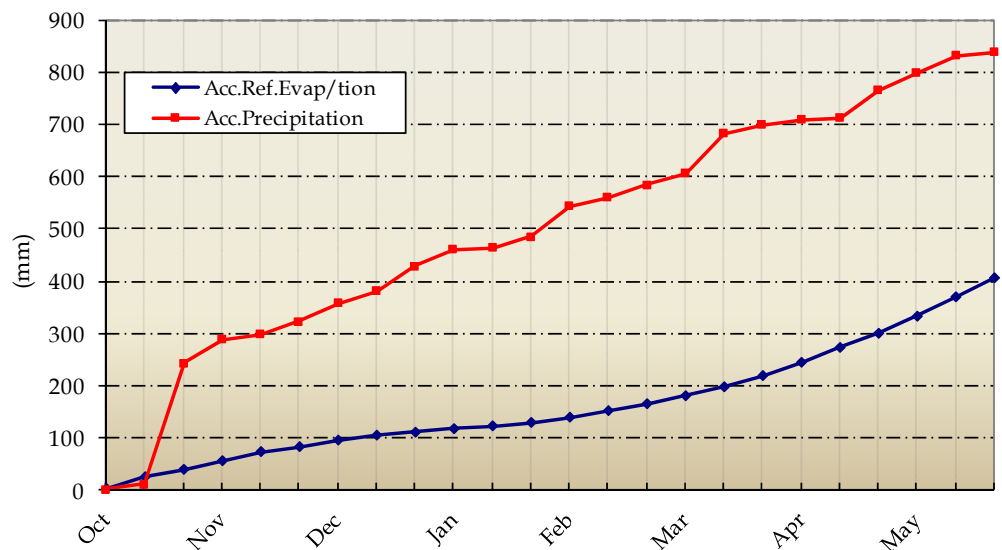
*Web addresses of HNMS
www.hnms.gr
www.emy.gov.gr
www.meteo.gov.gr
www.meteohellas.gr*

Agrinio

2nd 10-day period (11-20/05/2011)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	22.4	23.0	25.4	27.6	28.6	24.4	21.0	18.8	23.6	26.6	24.1	-	25.9
	Min	11.2	8.0	7.6	9.2	10.0	11.0	14.0	6.0	9.0	11.2	9.7	-	12.3
Relative Humidity	Max	71	94	97	97	92	90	95	98	95	93	92	-	-
	Min	37	35	29	34	32	33	44	71	39	36	39	-	-
Soil Temperature at 10 cm	06 UTC	17.6	16.8	16.8	17.8	18.6	19.0	19.2	16.8	16.6	18.0	17.7	-	19.3
	12 UTC	18.4	19.4	20.6	21.2	21.2	21.0	21.0	19.4	21.8	23.6	20.8	-	25.1
Sunshine Duration		3.5	7.8	12.7	12.6	12.6	5.6	6.7	1.8	11.4	9.7	8.4	-	8.6
Precipitation			0.4					1.5	3.7	1.4		7.0	-	10.8
Evaporation		3.7	5.0	6.0	5.8	12.2	4.9	4.3	0.5	6.0	8.2	56.6	-	61.0
Growing Degrees	5	11.8	10.5	11.5	13.4	14.3	12.7	12.5	7.4	11.3	13.9	119.3	-	141.2
	10	6.8	5.5	6.5	8.4	9.3	7.7	7.5	2.4	6.3	8.9	69.3	-	91.2

2nd 10-day period (11-20/05/2011)	Previous Year Value	Past Years Mean Value	
Reference Evapotranspiration	36.7	-	42.3
Precipitation - Reference Evapotranspiration	-29.7	-	-31.5
Number of Rainy Days	4.0	-	2.4
Number of Dry Days	1.0	-	-

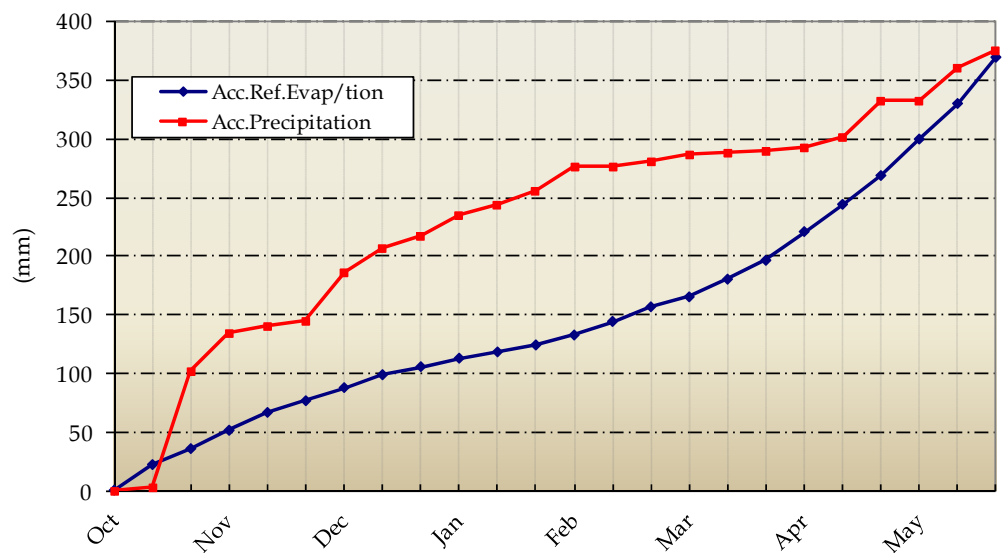
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



2nd 10-day period (11-20/05/2011)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	21.8	20.0	19.0	22.6	24.0	25.4	26.6	25.0	20.6	24.6	23.0	23.7	22.5
	Min	9.6	12.0	8.6	10.2	11.0	11.0	12.0	13.0	15.0	13.2	11.6	14.4	11.3
Relative Humidity	Max	83	98	97	92	93	83	84	83	93	93	90	84	-
	Min	32	48	65	44	45	36	35	40	60	52	46	42	-
Soil Temperature at 10 cm	06 UTC	15.0	15.2	14.0	14.6	15.0	16.4	17.4	18.6	18.6	17.0	16.2	20.5	17.0
	12 UTC	17.6	17.2	16.6	17.6	19.0	19.6	20.5	20.2	20.4	19.4	18.8	22.8	21.2
Sunshine Duration		10.3	5.2	7.5	10.9	12.6	12.6	11.6	11.2	0.1	10.9	9.3	9.1	8.2
Precipitation		0.0	6.4	5.5					0.0	0.6	2.2	14.7	9.0	10.7
Evaporation		7.3	0.1	2.4	3.8	3.3	5.8	6.4	5.4	0.3	4.6	39.4	59.0	57.1
Growing Degrees	5	10.7	11.0	8.8	11.4	12.5	13.2	14.3	14.0	12.8	13.9	122.6	140.4	118.8
	10	5.7	6.0	3.8	6.4	7.5	8.2	9.3	9.0	7.8	8.9	72.6	90.4	68.8

2nd 10-day period (11-20/05/2011)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	39.5	41.9	40.4
Precipitation - Reference Evapotranspiration	-24.8	-32.9	-29.7
Number of Rainy Days	4.0	2.0	2.3
Number of Dry Days	5.0	4.0	-

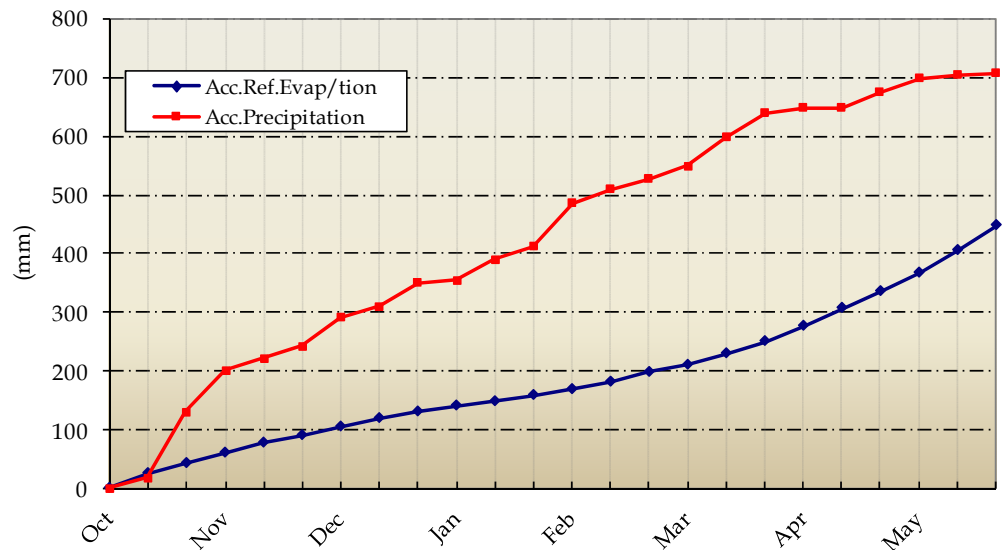
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



2nd 10-day period (11-20/05/2011)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	23.8	22.0	22.6	24.2	25.4	24.8	20.6	20.0	24.8	23.4	23.2	24.5	23.9
	Min	10.8	8.0	10.0	12.0	13.0	13.2	14.6	10.6	10.0	12.0	11.4	13.4	12.7
Relative Humidity	Max	82	88	90	91	89	91	89	90	92	93	90	93	-
	Min	33	36	42	33	33	34	49	52	42	45	40	40	-
Soil Temperature at 10 cm	06 UTC	16.2	16.0	16.6	16.5	18.4	19.2	19.2	18.2	17.2	18.2	17.6	19.9	19.3
	12 UTC	22.4	24.0	24.4	25.5	26.2	25.0	26.0	25.0	22.8	26.2	24.8	25.9	23.6
Sunshine Duration		7.4	12.0	12.6	12.8	11.8	9.3	8.6	5.7	11.9	12.7	10.5	9.7	9.4
Precipitation									2.7	0.0		2.7	12.2	8.3
Evaporation		3.2	6.5	6.1	7.2	5.6	7.2	6.2	2.7	6.0	9.5	60.2	57.4	54.3
Growing Degrees	5	12.3	10.0	11.3	13.1	14.2	14.0	12.6	10.3	12.4	12.7	122.9	139.6	133.2
	10	7.3	5.0	6.3	8.1	9.2	9.0	7.6	5.3	7.4	7.7	72.9	89.6	83.2

2nd 10-day period (11-20/05/2011)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	42.5	45.0	39.7
Precipitation - Reference Evapotranspiration	-39.8	-32.8	-31.4
Number of Rainy Days	1.0	4.0	1.6
Number of Dry Days	7.0	24.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

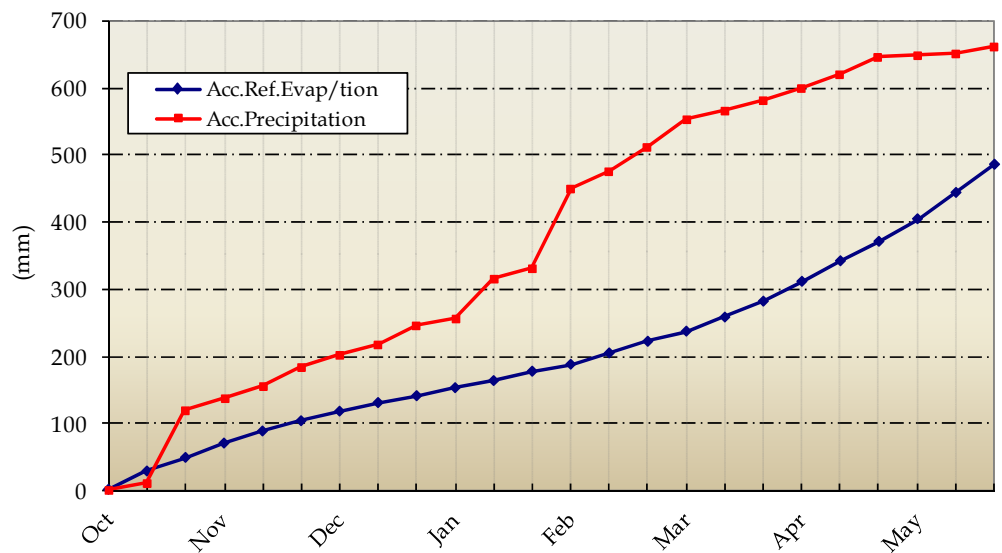


Kalamata

2nd 10-day period (11-20/05/2011)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	23.6	22.2	22.2	23.8	24.2	25.4	22.8	20.2	21.4	22.2	22.8	24.9	24.3
	Min	9.4	10.4	8.4	10.0	10.8	10.4	10.0	8.2	8.6	9.0	9.5	11.8	12.1
Relative Humidity	Max	93	97	97	93	98	93	95	95	97	95	95	93	-
	Min	25	37	52	40	41	33	53	48	49	53	43	37	-
Soil Temperature at 10 cm	06 UTC	16.6	17.0	15.0	16.2	17.8	18.2	18.2	17.2	17.0	17.4	17.1	18.6	18.7
	12 UTC	20.4	18.4	19.6	21.0	22.0	22.0	21.0	20.6	20.6	22.0	20.8	20.5	22.5
Sunshine Duration		10.1	8.2	12.2	11.4	12.3	11.4	7.3	6.7	8.1	11.4	9.9	9.6	9.1
Precipitation		0.4	8.3	0.9				0.1				9.7	3.6	9.5
Evaporation		6.2	6.2	6.2	5.8	7.4	6.7	4.5	2.5	4.6	7.0	57.1	56.0	57.5
Growing Degrees	5	11.5	11.3	10.3	11.9	12.5	12.9	11.4	9.2	10.0	10.6	111.6	133.4	132.1
	10	6.5	6.3	5.3	6.9	7.5	7.9	6.4	4.2	5.0	5.6	61.6	83.4	82.1

2nd 10-day period (11-20/05/2011)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	42.1	45.4	39.6
Precipitation - Reference Evapotranspiration	-32.4	-41.8	-30.1
Number of Rainy Days	4.0	2.0	1.8
Number of Dry Days	4.0	28.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

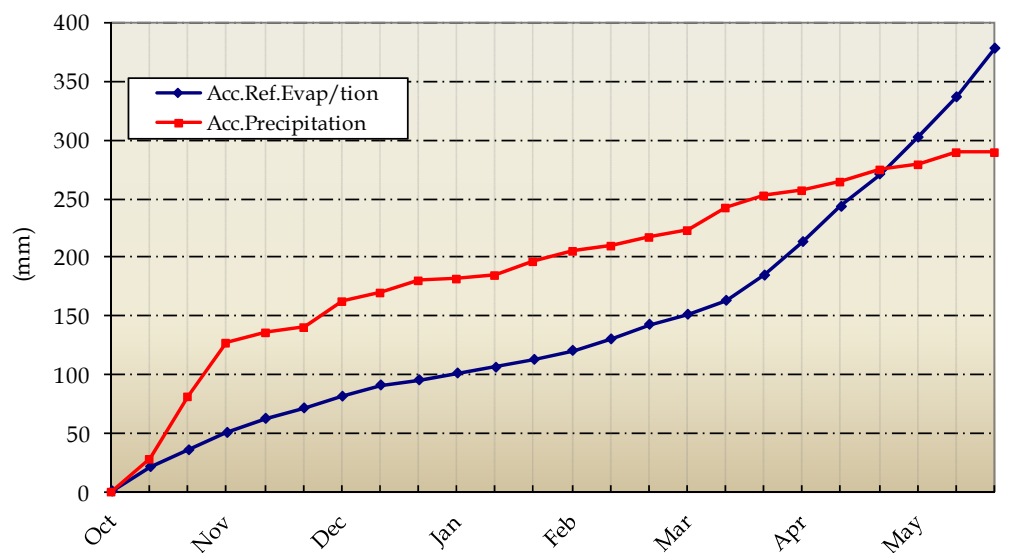


Larisa

2nd 10-day period (11-20/05/2011)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	21.0	21.8	25.8	27.8	29.6	26.6	24.4	22.6	22.0	26.6	24.8	27.0	25.6
	Min	9.0	7.4	7.4	9.6	11.0	10.8	11.6	11.0	11.6	10.8	10.0	12.8	11.0
Relative Humidity	Max	90	92	94	90	83	78	95	95	93	93	90	84	-
	Min	48	39	27	25	30	34	34	46	45	32	36	29	-
Soil Temperature at 10 cm	06 UTC	15.4	15.0	14.6	16.0	16.6	18.2	17.0	17.0	17.2	17.0	16.4	18.9	18.1
	12 UTC	15.0	17.2	17.6	18.2	22.0	19.4	19.8	20.0	20.2	20.2	19.0	20.8	20.4
Sunshine Duration		2.8	3.4	12.3	12.3	12.6	3.2	9.3	12.0	7.5	9.3	8.5	9.6	8.3
Precipitation		0.0						0.0	0.0			0.0	28.7	11.8
Evaporation		1.1	1.0	6.4	6.3	5.4	5.3	2.3	8.4	5.3	5.1	46.6	70.5	55.6
Growing Degrees	5	10.0	9.6	11.6	13.7	15.3	13.7	13.0	11.8	11.8	13.7	124.2	149.2	133.1
	10	5.0	4.6	6.6	8.7	10.3	8.7	8.0	6.8	6.8	8.7	74.2	99.2	83.1

2nd 10-day period (11-20/05/2011)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	41.5	51.7	42.0
Precipitation - Reference Evapotranspiration	-41.5	-23.0	-30.2
Number of Rainy Days	0.0	3.0	2.4
Number of Dry Days	15.0	19.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

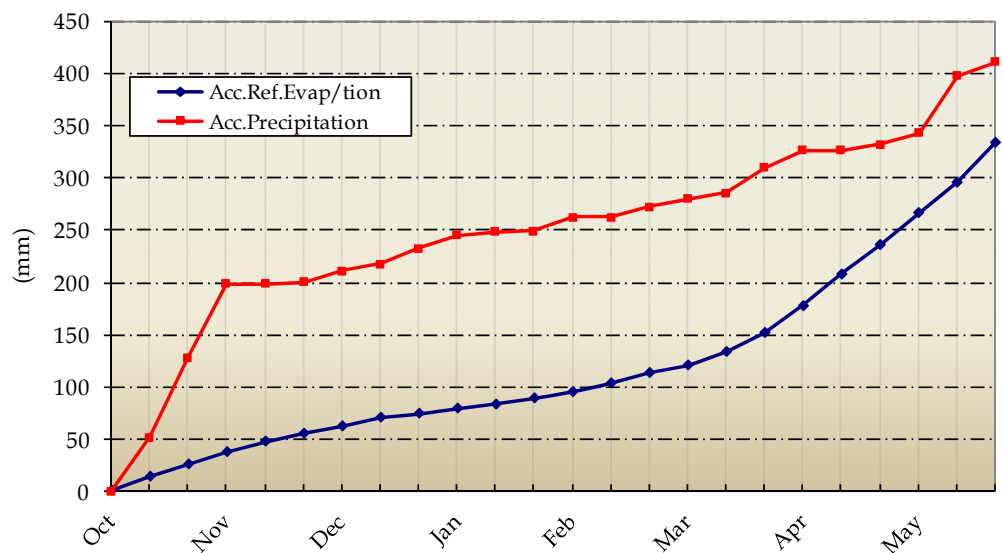


2nd 10-day period (11-20/05/2011)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	21.8	23.0	26.4	29.8	29.0	27.4	26.2	26.6	20.0	28.8	25.9	26.2	25.2
	Min	10.4	10.4	7.0	10.2	11.0	13.4	15.8	11.0	14.2	11.2	11.5	13.2	12.7
Relative Humidity	Max	87	90	94	91	88	83	81	85	95	96	89	68	-
	Min	34	35	23	22	27	33	31	42	70	26	34	32	-
Soil Temperature at 10 cm	06 UTC	15.8	15.6	15.2	17.2	18.4	19.4	19.8	19.0	20.0	17.4	17.8	20.0	18.0
	12 UTC	16.4	16.6	18.2	20.4	21.4	22.0	21.6	21.6	19.8	20.8	19.9	21.5	21.8
Sunshine Duration		4.8	4.4	11.9	12.3	11.8	6.7	8.3	11.7	0.4	10.5	8.3	9.0	7.4
Precipitation		0.9	1.5							11.4		13.8	10.7	16.8
Evaporation		1.6	1.5	5.0	5.5	5.4	3.7	7.2	3.6	0.4	4.2	38.1	42.6	43.2
Growing Degrees	5	11.1	11.7	11.7	15.0	15.0	15.4	16.0	13.8	12.1	15.0	136.8	147.4	139.0
	10	6.1	6.7	6.7	10.0	10.0	10.4	11.0	8.8	7.1	10.0	86.8	97.4	89.0

Series

2nd 10-day period (11-20/05/2011)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	38.3	44.7	35.7
Precipitation - Reference Evapotranspiration	-24.5	-34.0	-18.9
Number of Rainy Days	3.0	2.0	3.8
Number of Dry Days	1.0	5.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

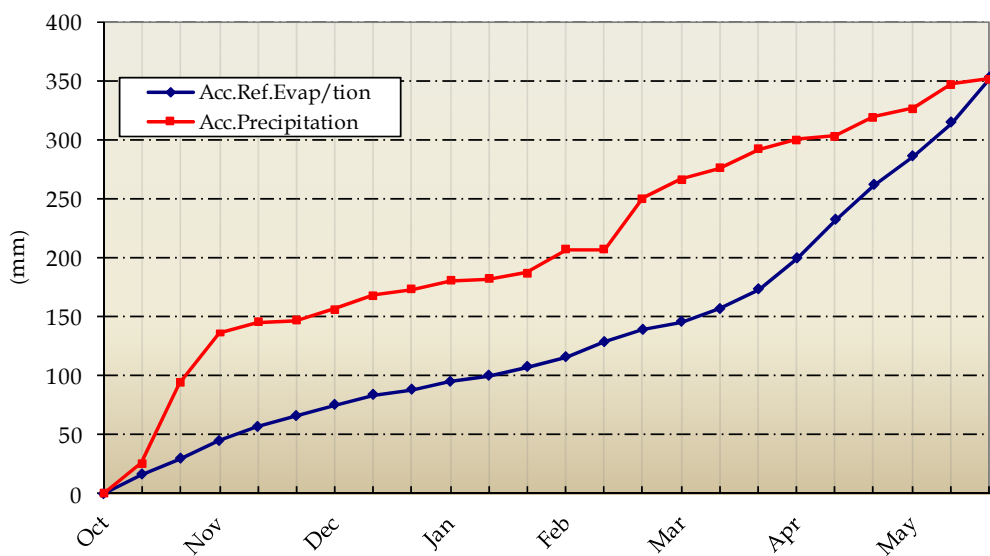


Trikala Imathias

2nd 10-day period (11-20/05/2011)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	22.0	-	26.6	29.6	-	29.4	25.8	27.0	20.0	28.6	26.1	25.4	25.7
	Min	10.4	-	9.8	16.6	-	12.8	13.8	17.2	14.8	11.8	13.4	13.9	13.3
Relative Humidity	Max	-	90	80	-	96	90	83	100	96	-	91	77	-
	Min	-	71	28	-	41	41	45	37	86	-	50	29	-
Soil Temperature at 10 cm	06 UTC	15.4	-	15.4	16.8	-	18.2	18.0	18.2	18.6	16.6	17.2	19.7	18.6
	12 UTC	17.2	-	19.0	20.4	-	20.4	20.2	20.8	18.4	20.0	19.6	22.4	20.3
Sunshine Duration		-	6.3	10.6	-	11.5	3.7	10.5	11.3	0.0	-	7.7	8.5	7.9
Precipitation										4.8		4.8	21.1	11.2
Evaporation		-	2.4	4.4	-	-	1.8	5.1	3.9	1.8	-	-	40.9	45.1
Growing Degrees	5	11.2	-	13.2	18.1	-	16.1	14.8	17.1	12.4	15.2	-	-	145.1
	10	6.2	-	8.2	13.1	-	11.1	9.8	12.1	7.4	10.2	-	-	95.1

2nd 10-day period (11-20/05/2011)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	38.0	45.1	39.8
Precipitation - Reference Evapotranspiration	-33.2	-24.0	-28.6
Number of Rainy Days	1.0	2.0	2.5
Number of Dry Days	13.0	6.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

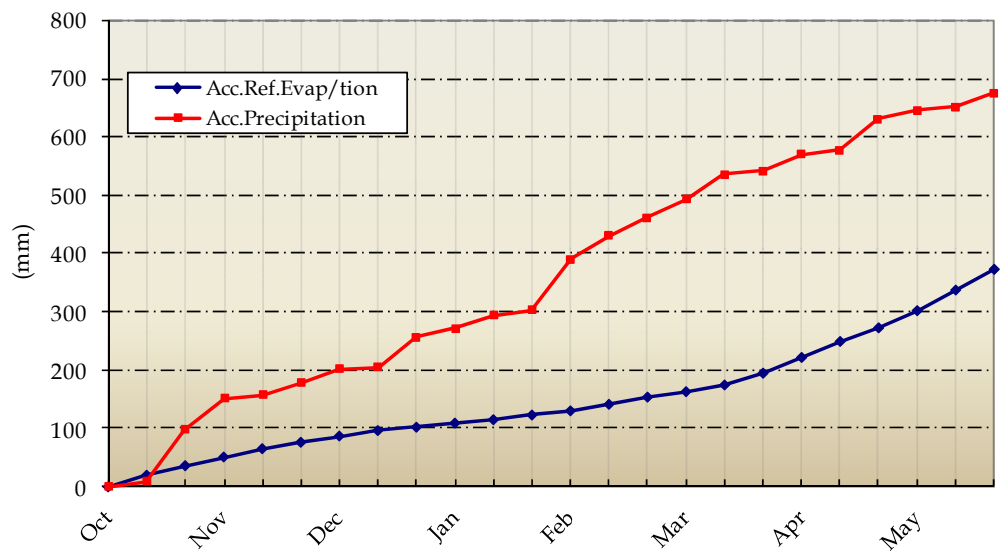


Tripoli

2nd 10-day period (11-20/05/2011)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	18.4	17.4	19.8	23.4	24.4	23.8	19.6	16.6	17.8	20.4	20.2	-	22.9
	Min	10.8	7.4	5.2	6.4	7.0	6.8	6.2	6.4	5.4	5.4	6.7	-	8.3
Relative Humidity	Max	54	95	97	94	94	91	94	97	97	97	91	-	-
	Min	36	39	43	36	32	35	43	55	55	44	42	-	-
Soil Temperature at 10 cm	06 UTC	14.4	15.0	13.0	13.6	15.2	16.2	16.2	16.4	13.6	13.6	14.7	-	16.7
	12 UTC	20.0	20.0	21.4	22.0	23.0	22.6	23.2	19.6	19.0	21.4	21.2	-	19.4
Sunshine Duration		10.6	6.2	8.8	11.2	9.2	10.7	12.1	4.6	6.9	8.1	8.8	-	8.4
Precipitation			13.5						7.2	2.3		23.0	-	15.5
Evaporation		5.0	2.5	4.0	4.0	4.0	5.0	5.0	1.5	3.0	2.0	36.0	-	41.0
Growing Degrees	5	9.6	7.4	7.5	9.9	10.7	10.3	7.9	6.5	6.6	7.9	84.3	-	106.0
	10	4.6	2.4	2.5	4.9	5.7	5.3	2.9	1.5	1.6	2.9	34.3	-	56.0

2nd 10-day period (11-20/05/2011)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	35.6	-	39.8
Precipitation - Reference Evapotranspiration	-12.6	-	-24.3
Number of Rainy Days	3.0	-	2.8
Number of Dry Days	6.0	-	-

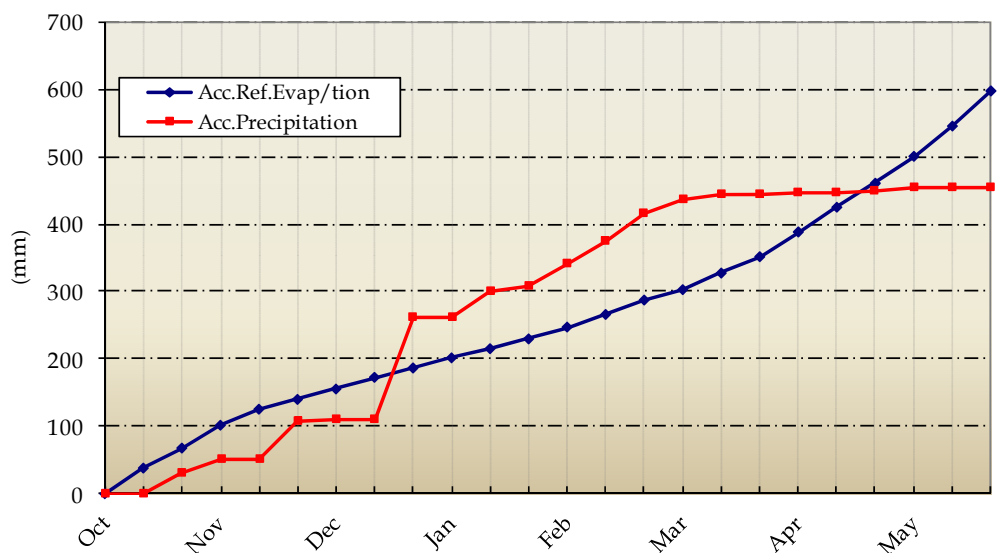
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



2nd 10-day period (11-20/05/2011)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	20.0	21.8	22.0	27.0	25.4	24.6	22.8	22.0	21.8	24.0	23.1	25.5	24.2
	Min	13.4	16.4	16.0	11.6	12.0	11.6	11.4	12.0	11.8	12.4	12.9	14.6	13.9
Relative Humidity	Max	98	56	58	78	73	93	98	98	94	90	84	90	-
	Min	35	32	27	18	25	24	50	51	36	35	33	31	-
Soil Temperature at 10 cm	06 UTC	21.6	20.4	20.8	21.2	22.2	22.8	23.6	23.4	23.0	22.4	22.1	24.3	23.3
	12 UTC	23.0	25.0	26.2	27.2	29.0	29.4	29.4	28.6	28.6	28.4	27.5	29.9	28.5
Sunshine Duration		3.8	11.7	12.5	12.9	12.8	12.8	12.5	10.5	11.7	13.0	11.4	8.2	9.8
Precipitation		1.2										1.2		3.2
Evaporation		6.3	10.5	9.8	9.8	9.0	7.1	6.8	6.9	7.7	7.1	81.0	78.5	70.3
Growing Degrees	5	11.7	14.1	14.0	14.3	13.7	13.1	12.1	12.0	11.8	13.2	130.0	150.7	140.1
	10	6.7	9.1	9.0	9.3	8.7	8.1	7.1	7.0	6.8	8.2	80.0	100.7	90.3

2nd 10-day period (11-20/05/2011)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	52.2	50.7	42.8
Precipitation - Reference Evapotranspiration	-51.0	-50.7	-39.6
Number of Rainy Days	1.0	0.0	0.5
Number of Dry Days	11.0	31.0	-

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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