



AGROMETEOROLOGICAL BULLETIN

June 2013
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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Web addresses of HNMS
www.hnms.gr
www.emy.gov.gr
www.meteo.gov.gr
www.meteohellas.gr

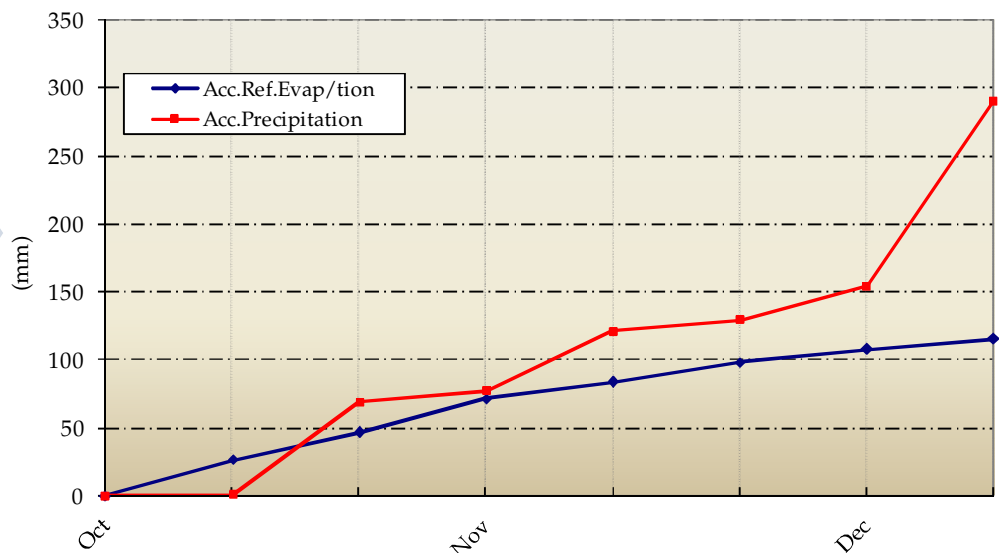
Agrinio

2nd 10-day period (11-20/06/2013)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	-	-	26.6	30.4	31.0	33.0	35.0	35.6	36.8	36.8	33.2	34.5	30.7
	Min	16.0	16.0	15.0	15.4	16.2	18.0	17.4	18.5	18.8	20.6	17.2	16.2	15.5
Relative Humidity	Max	81	88	94	90	88	90	76	80	66	66	82	64	-
	Min	31	49	46	39	43	40	36	29	26	34	37	29	-
Soil Temperature at 10 cm	06 UTC	24.8	24.6	22.6	22.4	22.4	24.8	25.2	26.2	27.0	28.0	24.8	27.6	24.5
	12 UTC	27.6	26.8	25.0	25.6	26.2	28.0	29.0	29.0	31.4	32.8	28.1	32.8	30.5
Sunshine Duration		9.5	6.1	6.9	9.6	13.2	13.5	13.6	13.9	13.8	13.6	11.4	13.9	10.9
Precipitation			17.2									17.2		7.2
Evaporation		7.5	5.1	4.3	5.7	9.0	6.5	6.0	12.6	10.7	10.3	77.7	102.9	80.5
Growing Degrees	5	-	-	15.8	17.9	18.6	20.5	21.2	22.1	22.8	23.7	-	203.5	180.7
	10	-	-	10.8	12.9	13.6	15.5	16.2	17.1	17.8	18.7	-	153.5	130.7

2nd 10-day period (11-20/06/2013)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	55.3	63.8	53.4
Precipitation - Reference Evapotranspiration	-38.1	-63.8	-46.2
Number of Rainy Days	1.0	0.0	1.1
Number of Dry Days	18.0	21.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

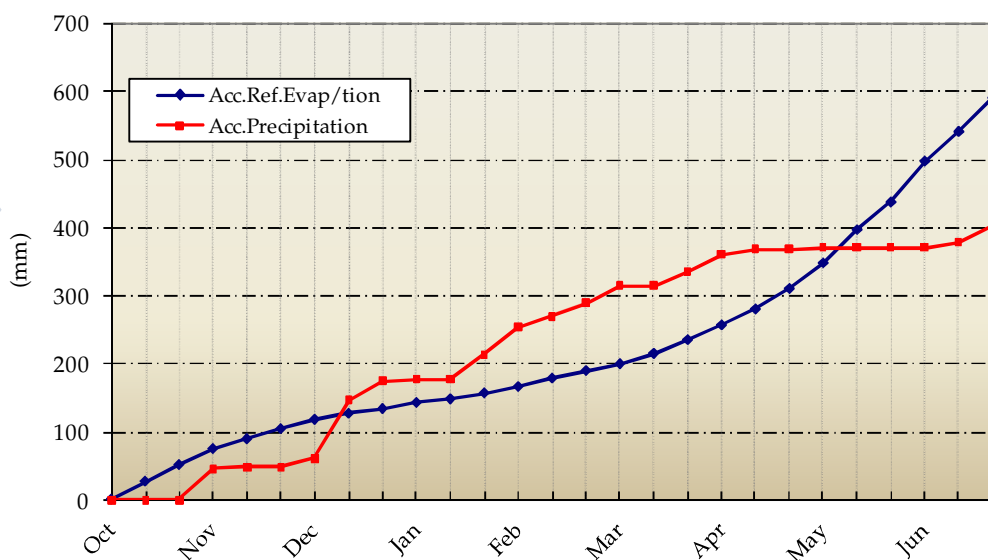
This station is not fully operated



2nd 10-day period (11-20/06/2013)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	30.6	26.4	24.4	26.2	26.8	28.4	32.0	34.0	33.4	32.4	29.5	31.9	27.5
	Min	18.4	17.0	17.4	17.0	17.6	17.6	18.8	19.5	21.0	21.8	18.6	20.3	15.2
Relative Humidity	Max	85	94	92	90	96	94	85	85	85	56	86	72	-
	Min	33	68	54	53	53	55	37	32	32	30	45	35	-
Soil Temperature at 10 cm	06 UTC	24.0	24.0	21.4	20.6	20.2	22.2	22.6	24.2	24.6	25.6	22.9	26.0	22.6
	12 UTC	28.8	23.4	22.4	22.8	24.6	25.0	28.0	29.0	29.6	29.2	26.3	29.6	27.3
Sunshine Duration		10.7	0.6	3.4	3.7	9.1	11.4	12.7	13.4	13.7	13.3	9.2	13.4	10.3
Precipitation			4.9	9.0	3.3	8.5						25.7		11.6
Evaporation		7.4	1.8	2.8	4.0	3.6	4.2	8.5	10.8	10.8	3.9	57.8	104.8	79.3
Growing Degrees	5	19.5	16.7	15.9	16.6	17.2	18.0	20.4	21.8	22.2	22.1	190.4	211.3	163.4
	10	14.5	11.7	10.9	11.6	12.2	13.0	15.4	16.8	17.2	17.1	140.4	161.3	113.4

2nd 10-day period (11-20/06/2013)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	49.8	67.4	52.7
Precipitation - Reference Evapotranspiration	-24.1	-67.4	-41.1
Number of Rainy Days	4.0	0.0	1.6
Number of Dry Days	3.0	14.0	-

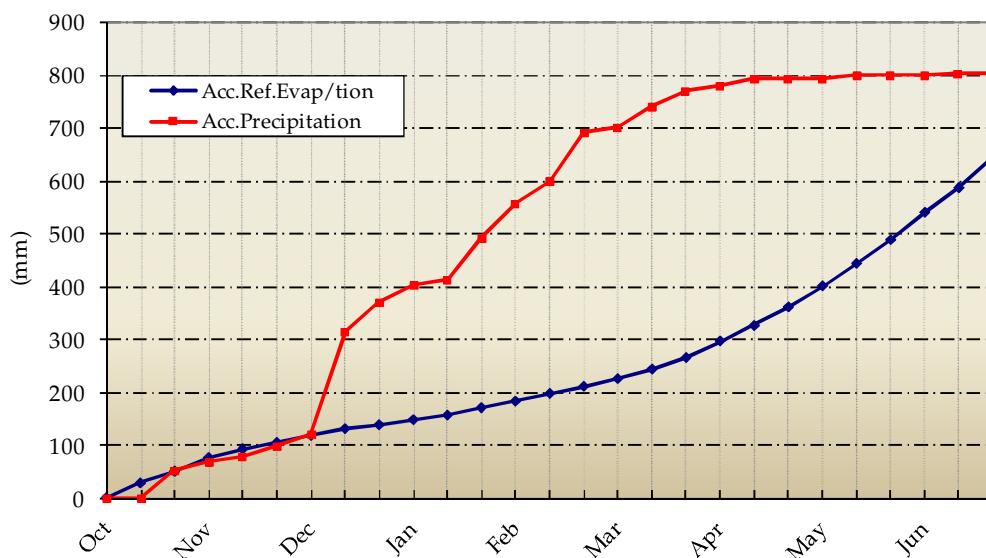
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



2nd 10-day period (11-20/06/2013)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	26.9	24.6	25.9	28.2	28.6	28.6	29.9	35.8	32.3	36.0	29.7	31.3	28.1
	Min	15.5	19.8	16.2	15.7	17.0	17.4	18.0	17.6	22.0	20.8	18.0	16.9	16.4
Relative Humidity	Max	84	84	87	88	85	86	86	89	85	65	84	84	-
	Min	43	53	46	38	41	42	42	20	35	26	39	31	-
Soil Temperature at 10 cm	06 UTC	24.8	25.4	24.8	25.2	25.8	26.2	26.6	27.2	28.0	28.2	26.2	25.8	24.8
	12 UTC	31.2	31.8	31.6	31.6	33.0	32.0	34.0	33.8	34.0	34.2	32.7	33.4	29.7
Sunshine Duration		12.9	11.8	11.6	10.0	13.4	13.4	13.3	13.6	13.4	13.3	12.7	13.2	11.5
Precipitation														2.1
Evaporation		9.4	10.6	2.4	8.0	6.6	5.0	5.0	10.4	12.3	9.5	79.2	103.2	71.4
Growing Degrees	5	16.2	17.2	16.1	17.0	17.8	18.0	19.0	21.7	22.2	23.4	188.4	191.0	172.2
	10	11.2	12.2	11.1	12.0	12.8	13.0	14.0	16.7	17.2	18.4	138.4	141.0	122.2

2nd 10-day period (11-20/06/2013)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	58.6	60.8	50.2
Precipitation - Reference Evapotranspiration	-58.6	-60.8	-48.1
Number of Rainy Days	0.0	0.0	0.4
Number of Dry Days	10.0	22.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

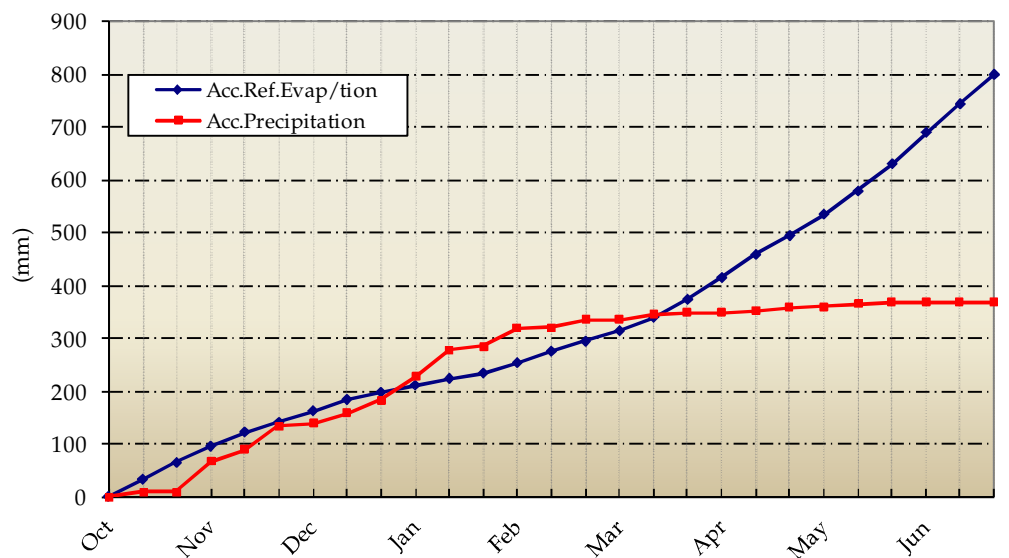


Iraklio

2nd 10-day period (11-20/06/2013)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	33.6	24.8	24.0	23.6	26.5	26.2	28.8	28.4	27.6	27.4	27.1	-	27.5
	Min	20.6	19.6	19.4	17.0	20.2	19.6	22.6	23.0	22.6	20.4	20.5	-	19.4
Relative Humidity	Max	86	78	87	84	85	91	80	80	80	81	83	-	-
	Min	29	58	74	69	59	65	58	62	66	66	61	-	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
Sunshine Duration		12.3	12.5	6.5	11.0	13.0	13.1	13.3	13.1	13.0	13.0	12.1	-	12.0
Precipitation													-	0.2
Evaporation		10.2	6.7	2.5	6.2	6.5	3.0	9.5	4.0	7.2	8.9	64.7	-	83.8
Growing Degrees	5	22.1	17.2	16.7	15.3	18.4	17.9	20.7	20.7	20.1	18.9	188.0	-	184.4
	10	17.1	12.2	11.7	10.3	13.4	12.9	15.7	15.7	15.1	13.9	138.0	-	134.4

2nd 10-day period (11-20/06/2013)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	55.8	-	-
Precipitation - Reference Evapotranspiration	-55.8	-	0.2
Number of Rainy Days	0.0	-	0.2
Number of Dry Days	33.0	-	-

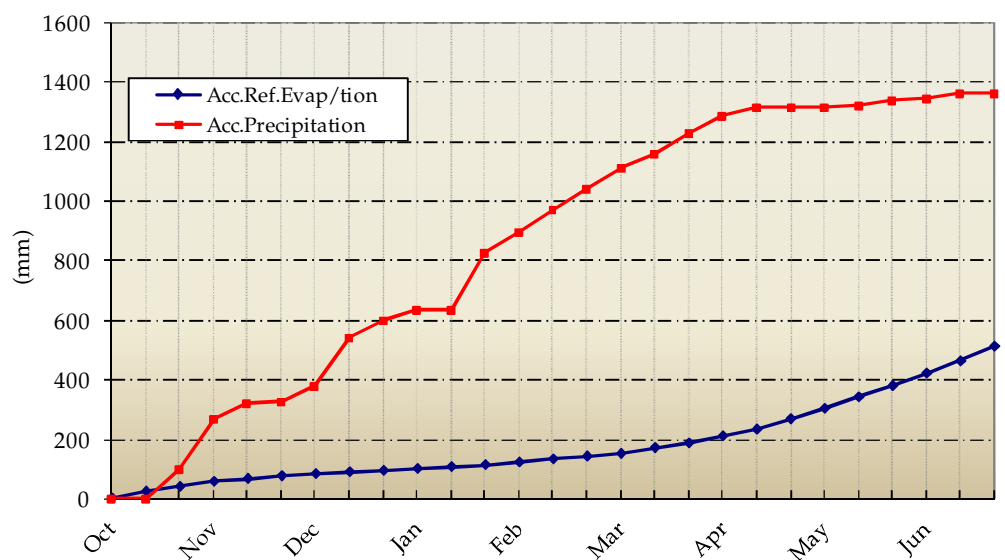
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



2nd 10-day period (11-20/06/2013)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	27.1	22.2	25.8	29.6	30.4	30.6	34.1	33.0	35.7	34.5	30.3	31.3	28.0
	Min	14.0	12.1	16.0	11.6	12.3	13.3	15.8	15.3	14.8	17.4	14.3	18.4	13.0
Relative Humidity	Max	91	86	87	96	74	64	93	61	58	84	79	60	-
	Min	32	40	32	26	34	28	24	25	25	21	29	28	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	20.6
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	25.0
Sunshine Duration		9.7	4.7	6.6	9.3	12.9	10.2	12.2	13.0	12.0	11.7	10.2	12.9	9.8
Precipitation		0.0	0.2	0.2	0.1							0.5		14.1
Evaporation		-	-	-	-	-	-	-	-	-	-	-	-	70.5
Growing Degrees	5	15.6	12.2	15.9	15.6	16.4	17.0	20.0	19.2	20.3	21.0	172.8	198.6	155.2
	10	10.6	7.2	10.9	10.6	11.4	12.0	15.0	14.2	15.3	16.0	122.8	148.6	105.2

2nd 10-day period (11-20/06/2013)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	49.4	66.3	46.5
Precipitation - Reference Evapotranspiration	-48.9	-66.3	-32.4
Number of Rainy Days	3.0	0.0	2.0
Number of Dry Days	3.0	15.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

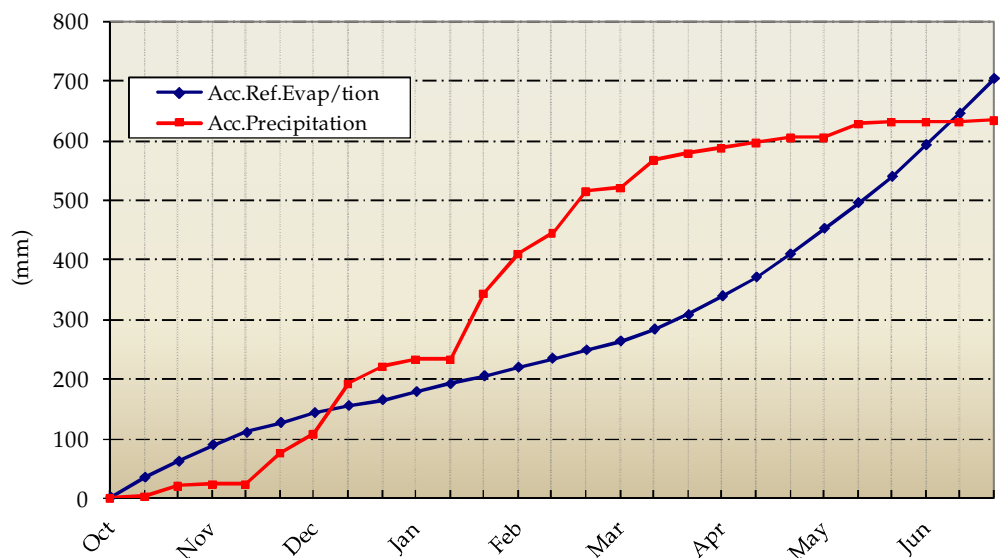


Kalamata

2nd 10-day period (11-20/06/2013)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	30.4	27.4	24.8	24.7	29.0	30.3	31.6	34.2	37.0	35.1	30.4	32.0	29.3
	Min	15.0	17.6	14.6	14.0	15.0	18.4	16.8	18.8	19.0	18.8	16.8	17.6	15.9
Relative Humidity	Max	82	88	93	93	92	89	83	87	89	83	88	82	-
	Min	27	33	51	52	42	38	34	35	19	22	35	28	-
Soil Temperature at 10 cm	06 UTC	21.8	22.2	22.0	21.2	21.2	22.4	22.6	23.0	23.4	24.6	22.4	24.2	23.0
	12 UTC	24.6	24.8	24.0	23.4	24.0	24.8	25.0	25.8	26.0	27.6	25.0	27.1	27.4
Sunshine Duration		12.6	12.3	5.8	7.8	12.7	12.7	12.8	13.2	13.2	13.0	11.6	13.2	11.0
Precipitation				2.4	0.6							3.0		3.1
Evaporation		6.8	9.3	3.2	5.8	7.4	7.2	8.9	11.6	9.6	10.6	80.4	80.3	80.7
Growing Degrees	5	17.7	17.5	14.7	14.4	17.0	19.4	19.2	21.5	23.0	22.0	186.3	198.1	175.9
	10	12.7	12.5	9.7	9.4	12.0	14.4	14.2	16.5	18.0	17.0	136.3	148.1	125.9

2nd 10-day period (11-20/06/2013)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	58.6	66.5	54.6
Precipitation - Reference Evapotranspiration	-55.6	-66.5	-51.5
Number of Rainy Days	2.0	0.0	0.9
Number of Dry Days	11.0	27.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

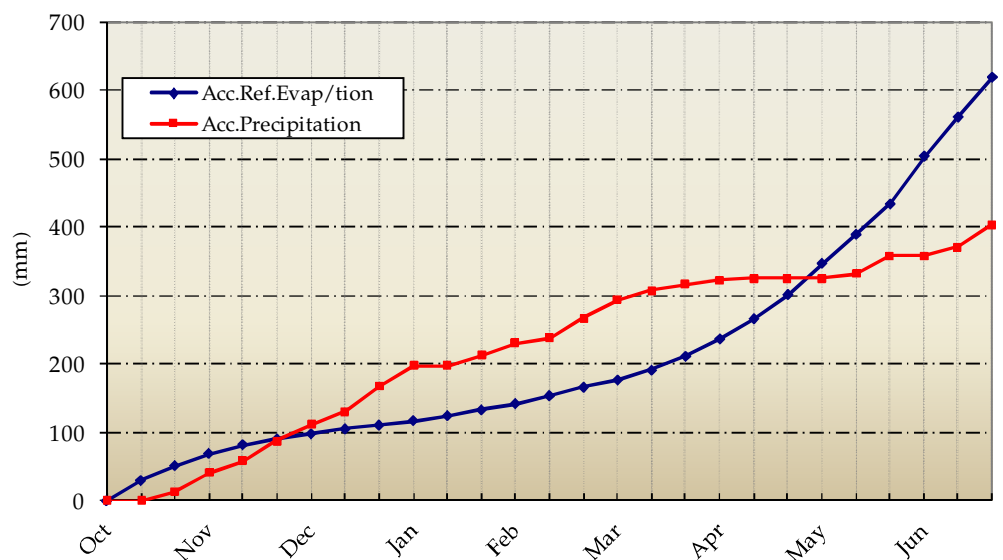


Larisa

2nd 10-day period (11-20/06/2013)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	27.6	27.0	27.2	29.4	32.8	34.4	35.4	35.3	36.0	34.2	31.9	34.6	31.7
	Min	18.9	13.2	16.7	16.9	16.0	16.8	17.6	18.6	18.8	21.8	17.5	16.9	15.7
Relative Humidity	Max	96	100	93	100	95	90	78	76	73	71	87	65	-
	Min	45	38	35	30	26	24	22	20	21	28	29	18	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	24.5	23.9
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	26.0	26.6
Sunshine Duration		3.4	7.0	6.3	10.2	12.5	12.6	11.9	12.5	12.7	12.0	10.1	13.1	10.5
Precipitation		6.4	23.6	0.7	1.6	0.0						32.3		6.2
Evaporation		9.3	4.3	4.2	6.1	13.3	9.9	10.9	13.0	13.5	13.0	97.5	97.4	85.8
Growing Degrees	5	18.3	15.1	17.0	18.2	19.4	20.6	21.5	22.0	22.4	23.0	197.3	207.2	186.8
	10	13.3	10.1	12.0	13.2	14.4	15.6	16.5	17.0	17.4	18.0	147.3	157.2	136.8

2nd 10-day period (11-20/06/2013)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	58.1	69.9	58.5
Precipitation - Reference Evapotranspiration	-25.8	-69.9	-52.3
Number of Rainy Days	4.0	0.0	1.7
Number of Dry Days	2.0	21.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

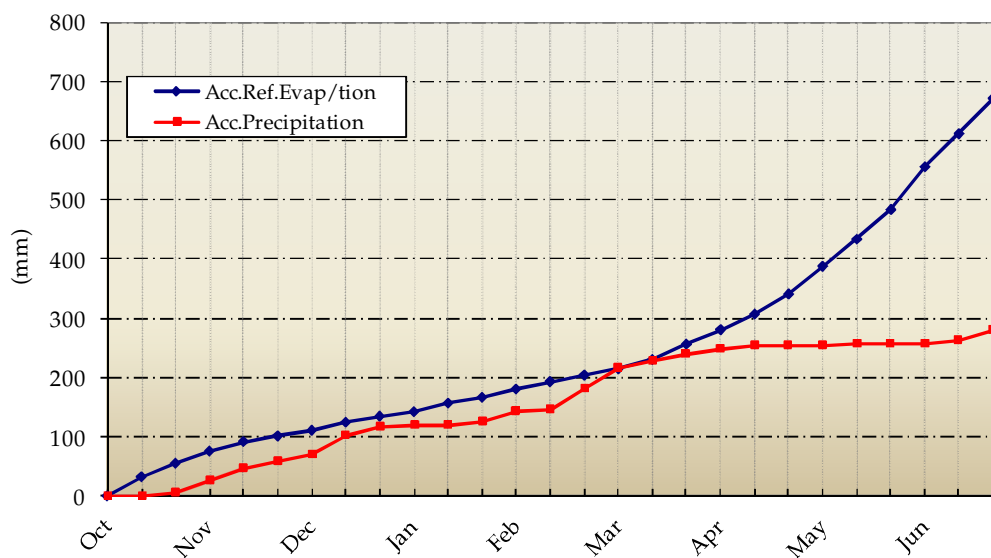


Mikra

2nd 10-day period (11-20/06/2013)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	26.0	24.6	27.3	28.9	32.3	33.2	34.0	34.8	35.4	33.5	31.0	33.2	29.7
	Min	18.0	18.4	18.6	18.4	16.9	17.0	19.2	20.8	22.0	22.8	19.2	20.5	17.0
Relative Humidity	Max	87	89	82	83	81	82	65	67	67	74	78	64	-
	Min	52	46	39	36	28	25	23	23	25	31	33	25	-
Soil Temperature at 10 cm	06 UTC	25.4	22.2	21.8	22.6	23.0	25.4	27.0	28.2	29.0	30.2	25.5	27.6	24.4
	12 UTC	29.2	25.8	25.4	28.4	29.0	30.4	30.0	35.0	35.6	36.0	30.5	31.5	29.1
Sunshine Duration		4.8	5.3	6.2	6.2	12.6	13.7	14.0	13.0	13.0	12.0	10.1	13.3	10.3
Precipitation		3.0	15.6	0.2								18.8		11.5
Evaporation		3.8	8.6	5.6	4.6	5.4	15.0	12.4	9.4	13.1	13.5	91.4	129.0	85.4
Growing Degrees	5	17.0	16.5	18.0	18.7	19.6	20.1	21.6	22.8	23.7	23.2	201.1	218.7	183.4
	10	12.0	11.5	13.0	13.7	14.6	15.1	16.6	17.8	18.7	18.2	151.1	168.7	133.4

2nd 10-day period (11-20/06/2013)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	59.8	74.4	57.4
Precipitation - Reference Evapotranspiration	-41.0	-74.4	-45.9
Number of Rainy Days	3.0	0.0	1.8
Number of Dry Days	0.0	21.0	-

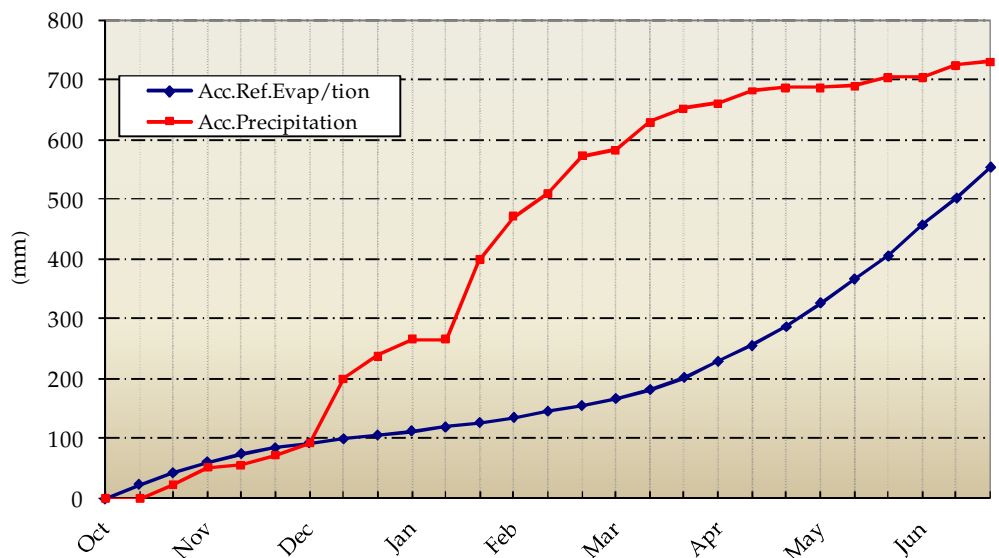
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



2nd 10-day period (11-20/06/2013)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	27.8	24.4	21.0	25.6	27.0	31.1	32.3	31.8	31.5	32.8	28.5	32.8	28.6
	Min	12.2	11.0	9.1	10.8	10.8	11.7	13.0	13.5	21.8	22.9	13.7	14.4	11.6
Relative Humidity	Max	85	88	96	96	92	71	90	48	42	42	75	57	-
	Min	26	37	48	42	30	44	26	23	25	22	32	19	-
Soil Temperature at 10 cm	06 UTC	22.8	23.2	19.0	18.6	19.8	21.2	23.2	24.4	25.8	26.4	22.4	25.8	22.7
	12 UTC	30.8	27.4	23.4	24.3	26.4	28.0	31.2	31.8	32.4	32.8	28.8	32.2	25.9
Sunshine Duration		12.4	7.1	4.2	9.1	12.7	9.2	10.4	12.0	11.8	12.0	10.1	13.4	10.8
Precipitation			4.3	1.4								5.7		5.7
Evaporation		8.5	4.8	1.4	4.0	6.2	6.4	8.0	11.2	9.4	11.5	71.4	91.1	62.0
Growing Degrees	5	15.0	12.7	10.1	13.2	13.9	16.4	17.7	17.7	21.7	22.9	161.1	186.1	151.2
	10	10.0	7.7	5.1	8.2	8.9	11.4	12.7	12.7	16.7	17.9	111.1	136.1	101.2

2nd 10-day period (11-20/06/2013)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	51.8	64.3	52.3
Precipitation - Reference Evapotranspiration	-46.1	-64.3	-46.6
Number of Rainy Days	2.0	0.0	1.4
Number of Dry Days	3.0	19.0	-

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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