



AGROMETEOROLOGICAL BULLETIN

*May 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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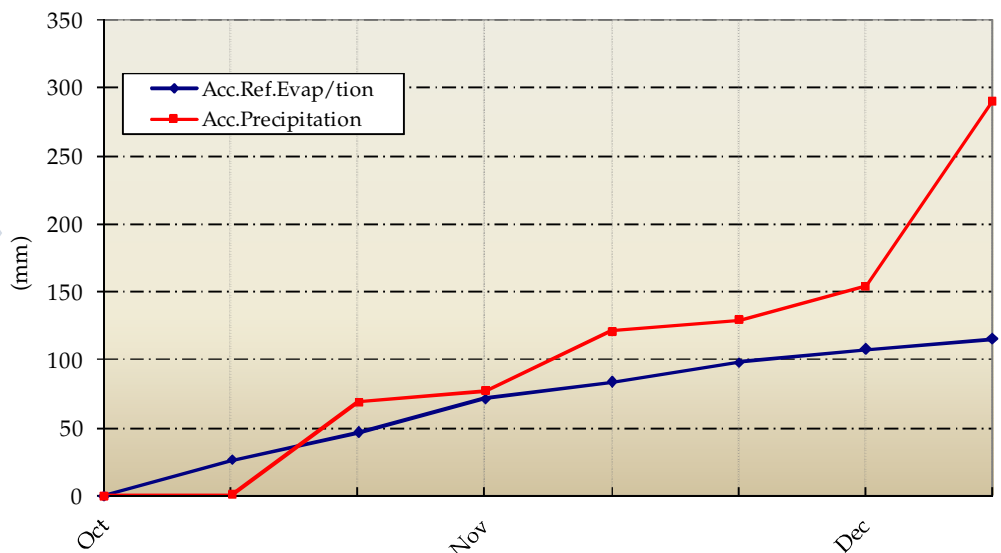
Agrinio

2nd 10-day period (11-20/05/2013)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	-	-	-	-	-	-	-	-	-	-		25.0	25.9
	Min	-	-	12.0	15.0	12.4	13.0	18.4	-	-	16.0	14.5	11.6	12.3
Relative Humidity	Max	-	91	91	96	91	87	-	-	88	90	91	83	-
	Min	-	45	61	48	47	42	-	-	32	45	46	43	-
Soil Temperature at 10 cm	06 UTC	-	-	20.6	20.0	20.4	20.4	21.0	-	-	22.6	20.8	20.3	19.3
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	23.0	25.1
Sunshine Duration		-	-	4.9	12.5	9.9	3.8	-	-	-	12.5	8.7	7.8	8.6
Precipitation				4.3	5.8							10.1	21.6	10.8
Evaporation		-	4.0	4.0	5.0	5.1	5.0	-	-	8.0	8.0	-	55.2	61.0
Growing Degrees	5	-	-	-	-	-	-	-	-	-	-	-	133.3	141.2
	10	-	-	-	-	-	-	-	-	-	-	-	83.3	91.2

2nd 10-day period (11-20/05/2013)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	-	40.7	42.3
Precipitation - Reference Evapotranspiration	-	-19.1	-31.5
Number of Rainy Days	2.0	4.0	2.4
Number of Dry Days	34.0	2.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

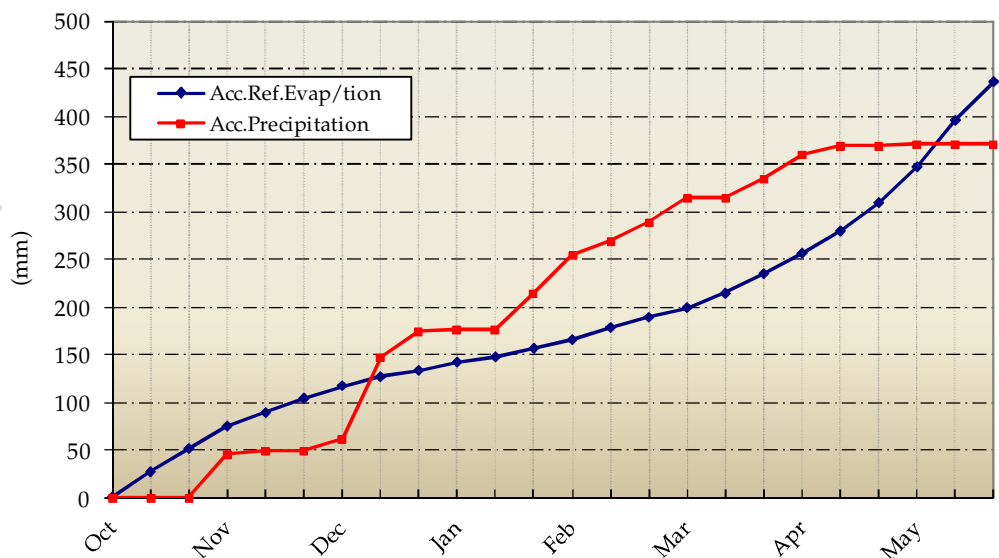
This station is not fully operated



2nd 10-day period (11-20/05/2013)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	24.2	23.8	21.8	18.4	23.4	25.0	26.4	25.6	29.2	28.4	24.6	22.7	22.5
	Min	8.8	13.2	12.0	14.4	12.0	14.0	16.2	17.4	16.4	14.0	13.8	15.3	11.3
Relative Humidity	Max	85	84	89	91	91	83	86	86	91	85	87	91	-
	Min	37	54	70	73	36	57	37	59	42	35	50	54	-
Soil Temperature at 10 cm	06 UTC	19.6	20.6	20.8	20.6	18.6	20.2	21.4	22.2	23.4	22.8	21.0	19.3	17.0
	12 UTC	23.6	25.0	25.0	21.0	23.2	23.6	24.8	25.8	25.8	27.0	24.5	21.9	21.2
Sunshine Duration		12.9	13.1	6.5	0.3	13.0	10.0	8.1	12.4	8.1	12.2	9.7	8.0	8.2
Precipitation				0.3	0.0							0.3	45.7	10.7
Evaporation		6.8	7.2	2.8	2.5	5.4	4.6	8.8	5.3	6.3	7.0	56.7	-	57.1
Growing Degrees	5	11.5	13.5	11.9	11.4	12.7	14.5	16.3	16.5	17.8	16.2	142.3	140.2	118.8
	10	6.5	8.5	6.9	6.4	7.7	9.5	11.3	11.5	12.8	11.2	92.3	90.2	68.8

2nd 10-day period (11-20/05/2013)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	40.6	38.9	40.4
Precipitation - Reference Evapotranspiration	-40.3	6.8	-29.7
Number of Rainy Days	1.0	8.0	2.3
Number of Dry Days	21.0	1.0	-

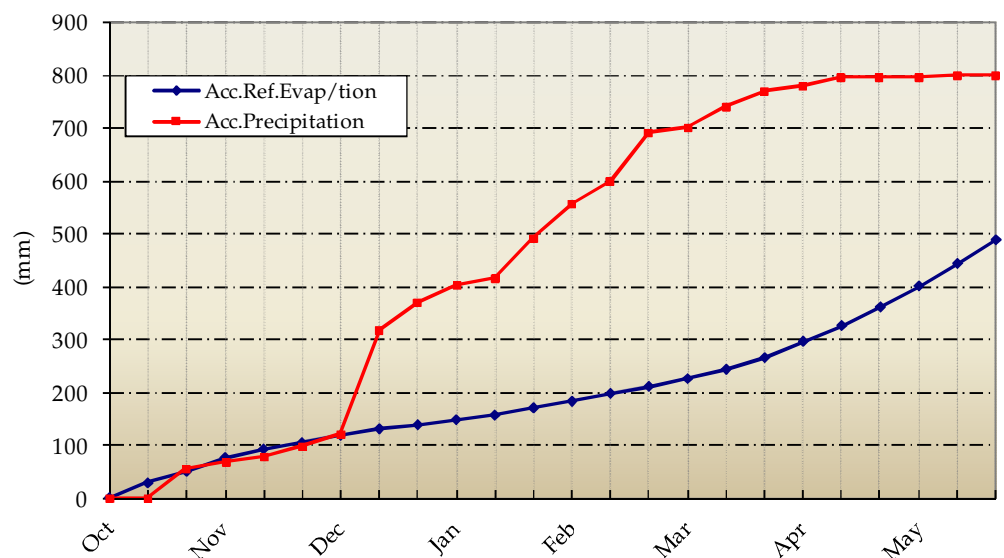
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



2nd 10-day period (11-20/05/2013)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	25.8	25.2	22.4	22.9	23.8	25.4	30.0	28.2	29.6	26.2	26.0	23.6	23.9
	Min	15.0	15.8	16.2	15.4	12.9	14.6	15.8	15.6	16.6	16.6	15.4	13.6	12.7
Relative Humidity	Max	89	89	70	87	89	82	85	86	86	89	85	88	-
	Min	44	49	51	48	43	36	29	37	32	47	42	44	-
Soil Temperature at 10 cm	06 UTC	20.0	21.4	21.2	21.0	20.4	21.6	21.2	21.2	23.0	23.4	21.4	19.9	19.3
	12 UTC	25.2	25.2	24.2	24.4	25.0	24.4	24.4	26.2	27.6	27.4	25.4	25.1	23.6
Sunshine Duration		11.9	10.3	10.0	11.7	12.0	3.1	0.2	10.4	8.2	10.9	8.9	8.6	9.4
Precipitation					0.7							0.7	8.2	8.3
Evaporation		5.5	4.6	7.1	5.0	8.3	2.2	6.5	6.0	6.0	8.0	59.2	70.2	54.3
Growing Degrees	5	15.4	15.5	14.3	14.2	13.4	15.0	17.9	16.9	18.1	16.4	157.0	135.9	133.2
	10	10.4	10.5	9.3	9.2	8.4	10.0	12.9	11.9	13.1	11.4	107.0	85.9	83.2

2nd 10-day period (11-20/05/2013)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	44.6	41.3	39.7
Precipitation - Reference Evapotranspiration	-43.9	-33.1	-31.4
Number of Rainy Days	1.0	3.0	1.6
Number of Dry Days	5.0	22.0	-

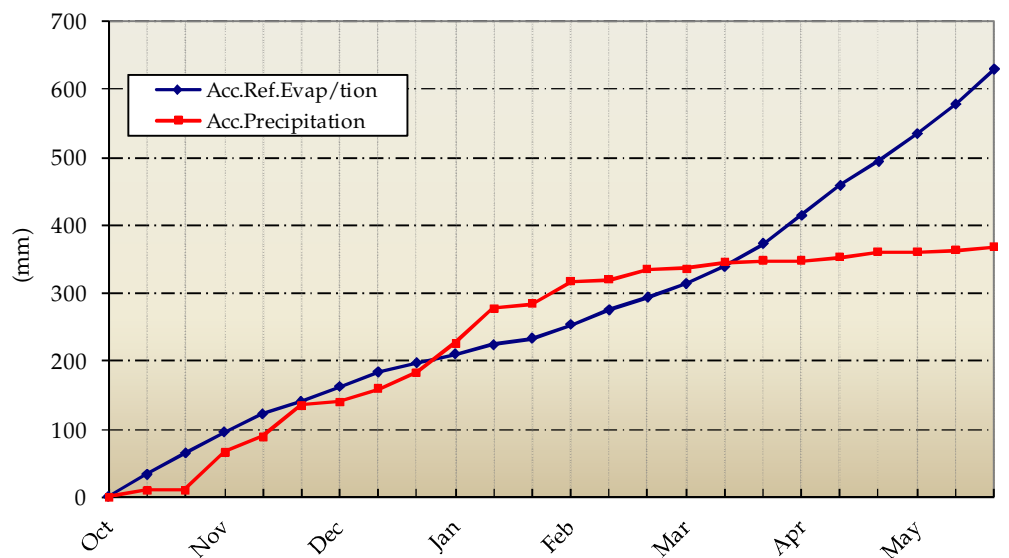
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



2nd 10-day period (11-20/05/2013)		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	24.6	24.4	22.2	23.4	29.4	29.0	36.0	27.8	29.8	26.9	-	23.1
	Min	17.2	15.2	16.0	18.0	15.4	14.6	21.8	23.4	18.8	19.4	18.0	-	15.3
Relative Humidity	Max	84	83	74	88	83	77	48	93	91	85	81	-	-
	Min	66	57	51	60	56	26	23	24	49	44	46	-	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
Sunshine Duration		11.1	11.7	12.7	7.2	12.7	3.5	0.6	10.9	9.7	10.7	9.1	-	9.7
Precipitation		0.1			3.5				0.3			3.9	-	3.5
Evaporation		1.5	13.9	3.8	4.0	3.8	3.4	13.6	7.8	7.8	6.2	65.8	-	61.2
Growing Degrees	5	14.8	14.9	15.2	15.1	14.4	17.0	20.4	24.7	18.3	19.6	174.4	-	142.0
	10	9.8	9.9	10.2	10.1	9.4	12.0	15.4	19.7	13.3	14.6	124.4	-	92.0

2nd 10-day period (11-20/05/2013)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	51.4	-	-
Precipitation - Reference Evapotranspiration	-47.5	-	3.5
Number of Rainy Days	3.0	-	0.9
Number of Dry Days	0.0	-	-

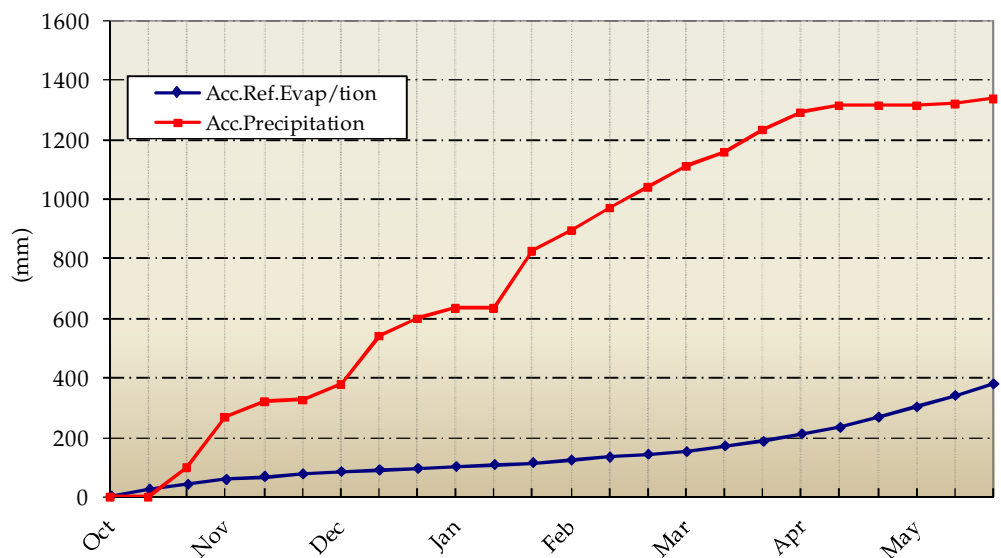
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



2nd 10-day period (11-20/05/2013)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	25.5	19.6	16.4	22.8	22.4	22.0	26.7	29.7	30.4	27.8	24.3	21.6	22.8
	Min	11.0	12.0	13.4	10.0	10.2	9.0	16.0	9.7	10.8	14.0	11.6	11.3	10.0
Relative Humidity	Max	100	99	89	70	96	81	91	78	73	74	85	88	-
	Min	39	52	70	50	32	26	32	25	24	26	38	48	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	15.6
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	19.5
Sunshine Duration		6.1	4.7	1.0	9.6	11.4	1.2	10.6	11.8	9.0	11.8	7.7	6.1	7.2
Precipitation		9.0	6.0	2.8			0.3					18.1	33.8	19.6
Evaporation		-	-	-	-	-	-	-	-	-	-	-	-	40.9
Growing Degrees	5	13.3	10.8	9.9	11.4	11.3	10.5	16.4	14.7	15.6	15.9	129.7	114.4	113.3
	10	8.3	5.8	4.9	6.4	6.3	5.5	11.4	9.7	10.6	10.9	79.7	64.4	63.4

2nd 10-day period (11-20/05/2013)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	38.2	33.5	34.9
Precipitation - Reference Evapotranspiration	-20.1	0.3	-15.3
Number of Rainy Days	4.0	6.0	3.4
Number of Dry Days	1.0	2.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

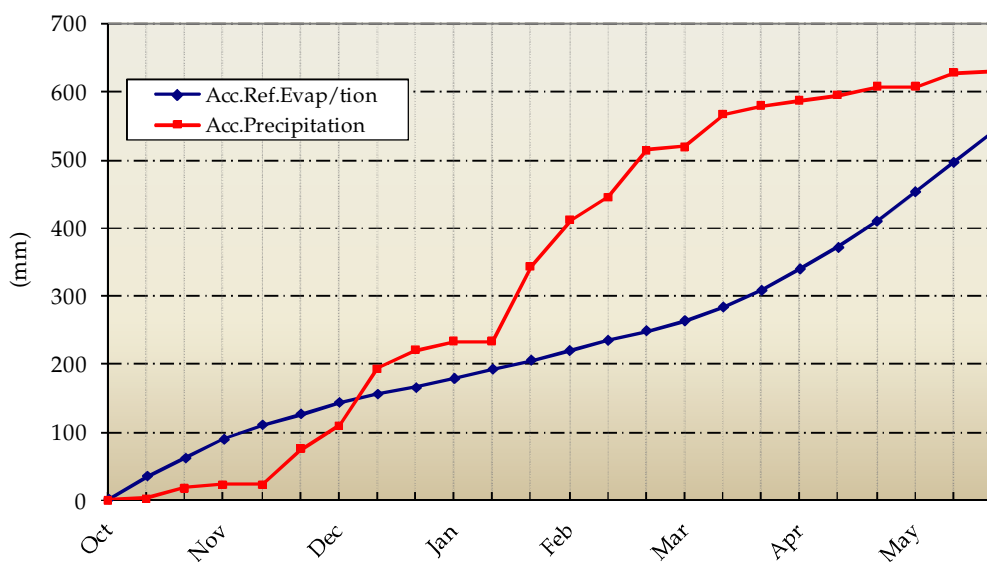


Kalamata

2nd 10-day period (11-20/05/2013)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	22.3	25.0	24.4	24.4	23.8	21.6	25.6	29.8	30.6	31.6	25.9	23.7	24.3
	Min	13.7	13.1	12.4	13.8	11.7	12.7	15.4	15.2	16.9	16.0	14.1	11.8	12.1
Relative Humidity	Max	90	93	93	92	93	92	88	86	89	89	90	93	-
	Min	56	48	44	48	40	57	48	33	33	35	44	45	-
Soil Temperature at 10 cm	06 UTC	18.6	19.4	19.0	19.0	18.8	20.0	19.0	19.0	22.4	21.0	19.6	18.7	18.7
	12 UTC	21.6	22.6	20.4	21.0	21.6	20.8	20.0	22.2	22.4	23.4	21.6	21.9	22.5
Sunshine Duration		11.2	11.4	8.7	8.7	11.9	2.3	0.0	11.2	7.2	11.3	8.4	9.2	9.1
Precipitation				1.3	0.7			0.6				2.6	4.0	9.5
Evaporation		7.8	4.4	3.1	6.0	6.6	5.8	2.0	2.4	6.2	9.4	53.7	50.2	57.5
Growing Degrees	5	13.0	14.1	13.4	14.1	12.8	12.2	15.5	17.5	18.8	18.8	150.0	127.4	132.1
	10	8.0	9.1	8.4	9.1	7.8	7.2	10.5	12.5	13.8	13.8	100.0	77.4	82.1

2nd 10-day period (11-20/05/2013)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	44.0	42.2	39.6
Precipitation - Reference Evapotranspiration	-41.4	-38.2	-30.1
Number of Rainy Days	3.0	5.0	1.8
Number of Dry Days	3.0	0.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

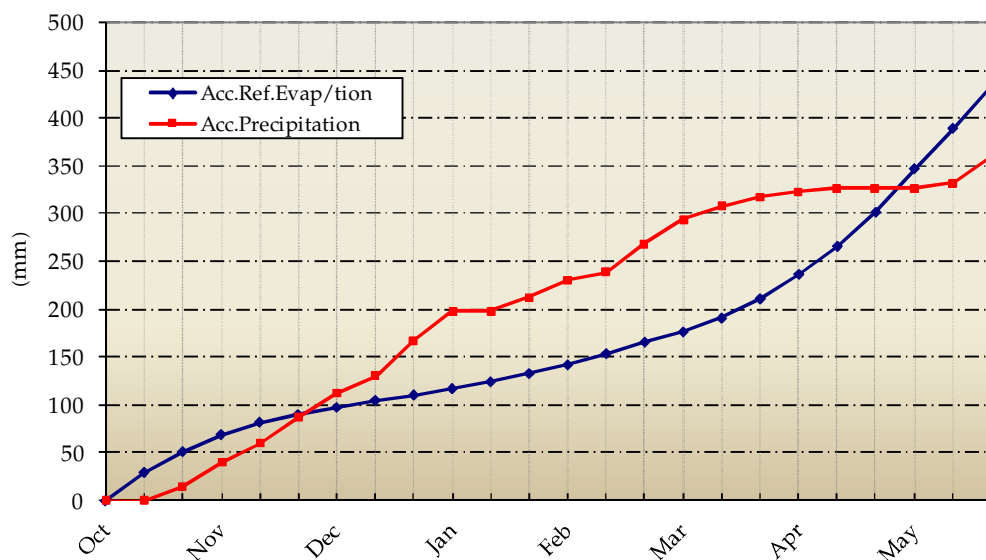


Larisa

2nd 10-day period (11-20/05/2013)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	29.9	26.4	22.4	25.4	27.4	26.2	28.8	33.8	34.0	33.9	28.8	24.7	25.6
	Min	9.5	13.6	14.4	12.6	12.2	11.4	15.6	13.4	14.5	18.2	13.5	12.4	11.0
Relative Humidity	Max	99	99	100	98	100	96	97	97	83	78	95	93	-
	Min	20	20	51	35	31	31	26	16	18	22	27	38	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	20.6	-	22.2	-	21.4	17.9	18.1
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	18.7	20.4
Sunshine Duration		9.6	9.6	2.2	8.1	11.8	2.1	2.5	10.1	11.5	11.1	7.9	7.4	8.3
Precipitation		0.5	13.7	12.1	0.1		0.0	0.1				26.5	34.1	11.8
Evaporation		7.7	7.7	2.1	3.8	8.7	5.2	7.7	6.6	9.9	10.8	70.2	-	55.6
Growing Degrees	5	14.7	15.0	13.4	14.0	14.8	13.8	17.2	18.6	19.3	21.1	161.8	135.6	133.1
	10	9.7	10.0	8.4	9.0	9.8	8.8	12.2	13.6	14.3	16.1	111.8	85.6	83.1

2nd 10-day period (11-20/05/2013)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	44.3	40.0	42.0
Precipitation - Reference Evapotranspiration	-17.8	-5.9	-30.2
Number of Rainy Days	5.0	7.0	2.4
Number of Dry Days	0.0	1.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

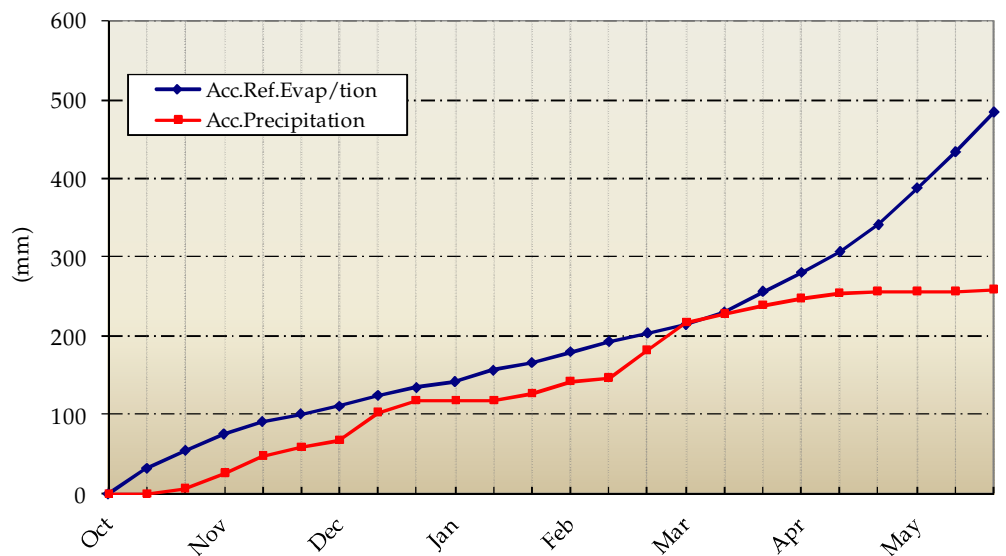


Mikra

2nd 10-day period (11-20/05/2013)		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	24.8	22.8	24.2	26.5	25.0	25.2	30.7	32.5	30.8	27.0	23.5	24.3
	Min	12.0	15.0	16.6	15.2	11.2	13.4	16.8	13.6	15.0	17.0	14.6	14.2	12.4
Relative Humidity	Max	80	82	76	67	79	83	86	88	75	81	80	86	-
	Min	27	44	51	38	29	34	47	28	22	31	35	43	-
Soil Temperature at 10 cm	06 UTC	23.4	22.6	22.0	19.0	19.8	22.8	21.8	22.6	23.4	25.0	22.2	19.0	18.8
	12 UTC	26.2	26.2	25.2	22.8	27.2	27.0	27.8	28.4	30.4	30.8	27.2	23.2	23.5
Sunshine Duration		11.7	4.8	4.3	7.9	12.5	1.1	7.4	12.0	12.3	10.4	8.4	6.3	8.1
Precipitation				1.6	0.0			0.0				1.6	29.5	11.8
Evaporation		6.9	3.4	5.4	8.8	5.0	5.6	8.4	4.4	9.6	8.2	65.7	45.2	56.4
Growing Degrees	5	14.8	14.9	14.7	14.7	13.9	14.2	16.0	17.2	18.8	18.9	158.0	138.6	133.6
	10	9.8	9.9	9.7	9.7	8.9	9.2	11.0	12.2	13.8	13.9	108.0	88.6	83.6

2nd 10-day period (11-20/05/2013)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	50.4	40.9	40.9
Precipitation - Reference Evapotranspiration	-48.8	-11.4	-29.1
Number of Rainy Days	1.0	7.0	3.0
Number of Dry Days	3.0	0.0	-

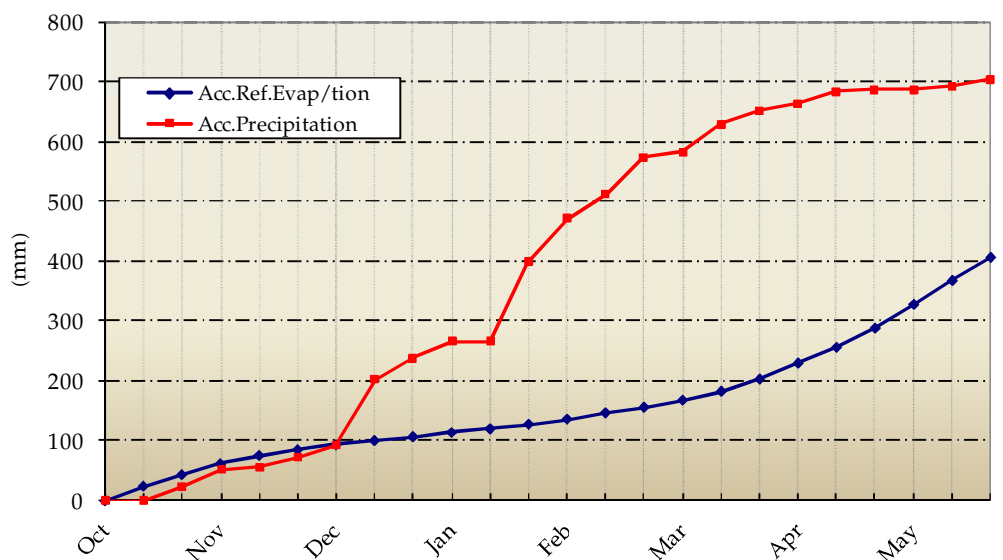
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



2nd 10-day period (11-20/05/2013)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	23.1	23.0	20.0	20.5	23.3	25.7	25.0	29.7	31.4	29.4	25.1	21.7	22.9
	Min	9.2	7.8	7.8	10.1	6.9	8.8	10.5	9.7	12.9	13.0	9.7	9.3	8.3
Relative Humidity	Max	95	73	63	79	97	89	63	93	82	71	80	78	-
	Min	36	30	35	44	36	27	37	19	17	15	30	40	-
Soil Temperature at 10 cm	06 UTC	17.0	16.0	16.4	17.4	16.2	18.2	18.2	17.2	20.2	21.4	17.8	16.9	16.7
	12 UTC	24.2	23.0	23.4	22.0	24.4	24.4	21.8	26.2	28.0	29.8	24.7	22.9	19.4
Sunshine Duration		6.8	11.3	8.8	6.0	11.6	3.5	1.2	10.3	7.3	11.0	7.8	8.7	8.4
Precipitation		5.8	0.0	0.5	2.6		0.0	3.9				12.8	9.5	15.5
Evaporation		3.5	5.1	4.9	2.9	5.6	3.2	2.7	6.5	6.5	7.0	47.9	45.4	41.0
Growing Degrees	5	11.2	10.4	8.9	10.3	10.1	12.3	12.8	14.7	17.2	16.2	123.9	105.1	106.0
	10	6.2	5.4	3.9	5.3	5.1	7.3	7.8	9.7	12.2	11.2	73.9	55.1	56.0

2nd 10-day period (11-20/05/2013)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	38.6	38.7	39.8
Precipitation - Reference Evapotranspiration	-25.8	-29.2	-24.3
Number of Rainy Days	4.0	4.0	2.8
Number of Dry Days	0.0	4.0	-

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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