



AGROMETEOROLOGICAL BULLETIN

*May 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

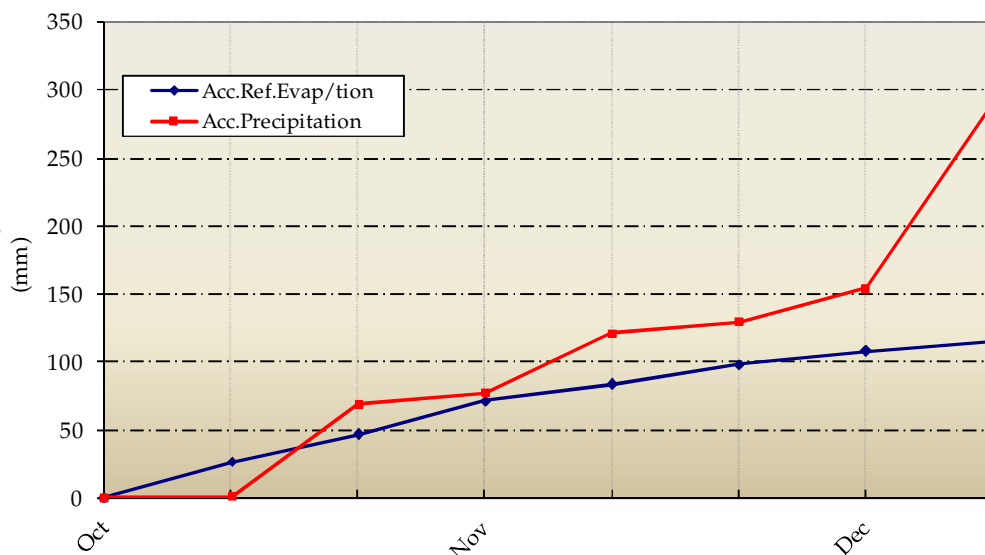
Web addresses of HNMS
www.hnms.gr
www.emy.gov.gr
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Agrinio

3rd 10-day period (21-31/05/2013)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	-	-	-	-	-	-	-	-	-	-	-		23.5	27.7
	Min	12.2	17.2	18.0	15.6	-	-	9.6	10.0	21.8	14.0	15.8	14.9	13.4	13.3
Relative Humidity	Max	87	72	84	-	-	91	89	76	60	79	-	80	90	-
	Min	43	31	70	-	-	38	39	35	33	46	-	42	53	-
Soil Temperature at 10 cm	06 UTC	21.8	22.6	23.0	21.0	-	-	20.2	20.6	22.2	23.0	23.8	22.0	19.9	21.0
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	21.7	27.3
Sunshine Duration		7.2	7.6	2.3	-	-	-	13.0	4.1	12.0	12.2	-	8.3	6.9	9.3
Precipitation			0.2	0.9	4.9								6.0	29.3	10.2
Evaporation		7.0	8.8	6.2	-	-	5.0	6.0	9.0	7.0	6.0	-	-	62.9	71.9
Growing Degrees	5	-	-	-	-	-	-	-	-	-	-	-	-	148.2	170.2
	10	-	-	-	-	-	-	-	-	-	-	-	-	93.2	115.2

3rd 10-day period (21-31/05/2013)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	-	40.4	49.7
Precipitation - Reference Evapotranspiration	-	-11.1	-39.5
Number of Rainy Days	3.0	6.0	1.9
Number of Dry Days	7.0	6.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



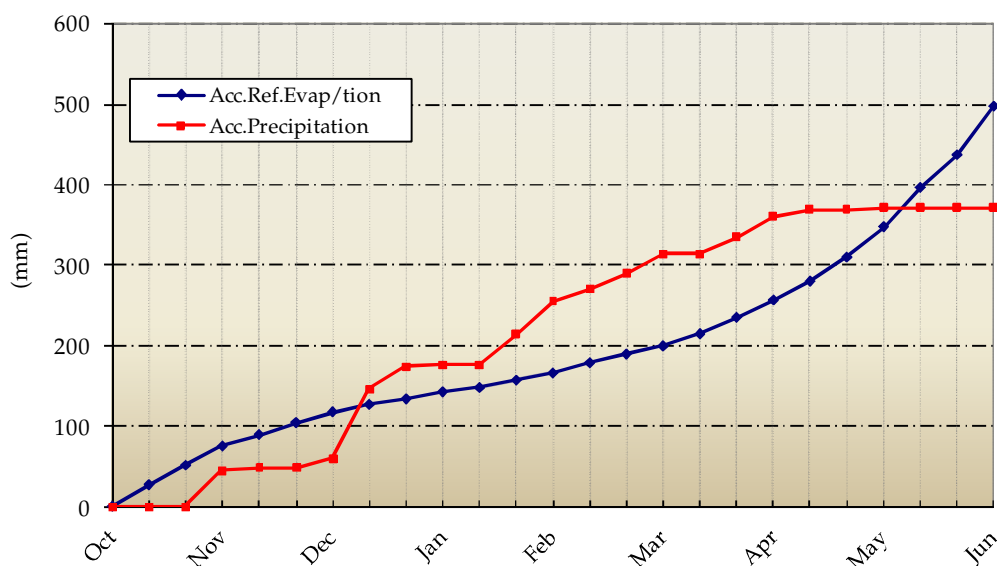
This station is not fully operated

Alexandroupoli

3rd 10-day period (21-31/05/2013)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	31.0	28.2	26.4	24.4	26.2	25.6	26.2	25.0	33.0	25.4	26.2	27.1	22.4	24.2
	Min	14.6	16.6	18.8	18.4	15.2	15.4	11.5	13.4	17.8	19.8	19.4	16.4	13.3	12.7
Relative Humidity	Max	86	88	87	88	88	87	79	79	80	85	84	85	94	-
	Min	31	44	53	45	49	44	33	45	17	54	38	41	58	-
Soil Temperature at 10 cm	06 UTC	23.4	24.2	24.8	24.2	23.4	23.4	23.2	22.8	24.2	25.4	25.6	24.1	18.9	19.3
	12 UTC	27.4	27.6	27.0	26.8	26.6	27.0	27.0	26.8	27.0	28.4	28.4	27.3	22.9	23.6
Sunshine Duration		13.3	11.7	12.6	12.0	13.1	13.3	13.3	12.1	10.0	10.4	12.3	12.2	8.3	8.3
Precipitation														45.3	12.4
Evaporation		8.6	7.7	9.5	7.9	8.0	0.5	17.7	6.2	11.0	7.1	9.3	93.5	43.3	70.1
Growing Degrees	5	17.8	17.4	17.6	16.4	15.7	15.5	13.9	14.2	20.4	17.6	17.8	184.3	141.3	147.7
	10	12.8	12.4	12.6	11.4	10.7	10.5	8.9	9.2	15.4	12.6	12.8	129.3	86.3	92.7

3rd 10-day period (21-31/05/2013)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	60.4	41.1	45.7
Precipitation - Reference Evapotranspiration	-60.4	4.2	-33.3
Number of Rainy Days	0.0	4.0	2.4
Number of Dry Days	18.0	3.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

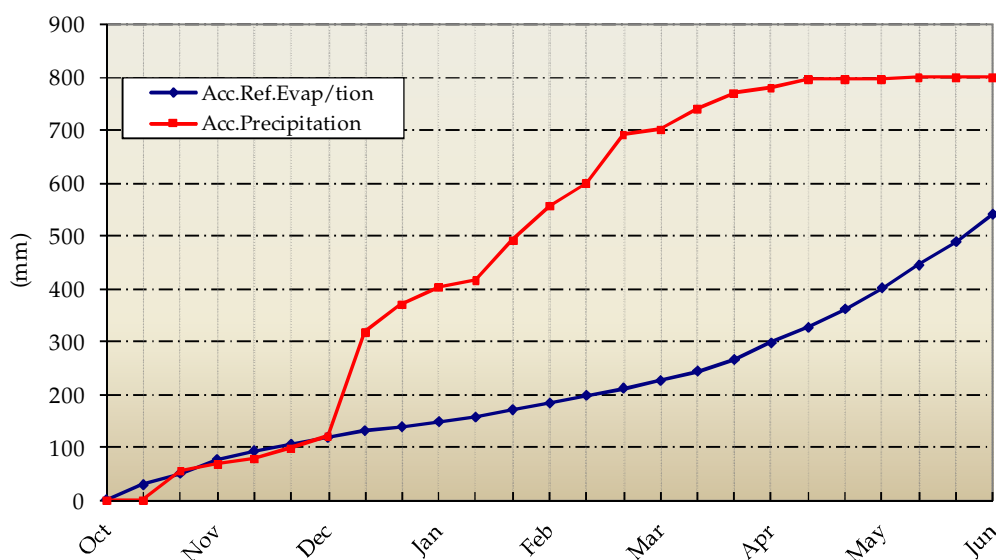


Andravida

3rd 10-day period (21-31/05/2013)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	27.1	30.5	28.6	23.2	23.9	21.8	24.1	26.3	25.5	26.9	23.0	25.5	23.6	25.4
	Min	14.2	17.8	18.0	17.6	13.8	14.6	18.0	10.8	17.2	15.0	15.4	15.7	14.0	14.0
Relative Humidity	Max	80	78	82	87	89	67	81	83	84	86	85	82	89	-
	Min	30	15	58	40	40	49	26	24	57	41	37	38	49	-
Soil Temperature at 10 cm	06 UTC	22.2	23.8	23.4	21.6	21.6	22.2	21.2	21.4	22.6	23.0	23.8	22.4	20.3	21.4
	12 UTC	26.8	26.8	26.2	27.0	28.4	27.4	27.4	25.2	29.0	30.0	29.4	27.6	26.2	25.8
Sunshine Duration		7.7	6.3	5.8	11.9	12.6	12.2	13.1	2.3	7.4	12.8	12.3	9.5	8.8	10.2
Precipitation				0.1	0.8							0.0	0.9	26.3	6.8
Evaporation		5.1	7.2	6.3	7.3	7.1	5.0	8.8	4.8	5.7	3.6	11.6	72.5	58.3	63.7
Growing Degrees	5	15.7	19.2	18.3	15.4	13.9	13.2	16.1	13.6	16.4	16.0	14.2	171.7	151.9	161.7
	10	10.7	14.2	13.3	10.4	8.9	8.2	11.1	8.6	11.4	11.0	9.2	116.7	96.9	106.7

3rd 10-day period (21-31/05/2013)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	51.9	45.6	48.0
Precipitation - Reference Evapotranspiration	-51.0	-19.3	-41.2
Number of Rainy Days	2.0	2.0	1.0
Number of Dry Days	8.0	6.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

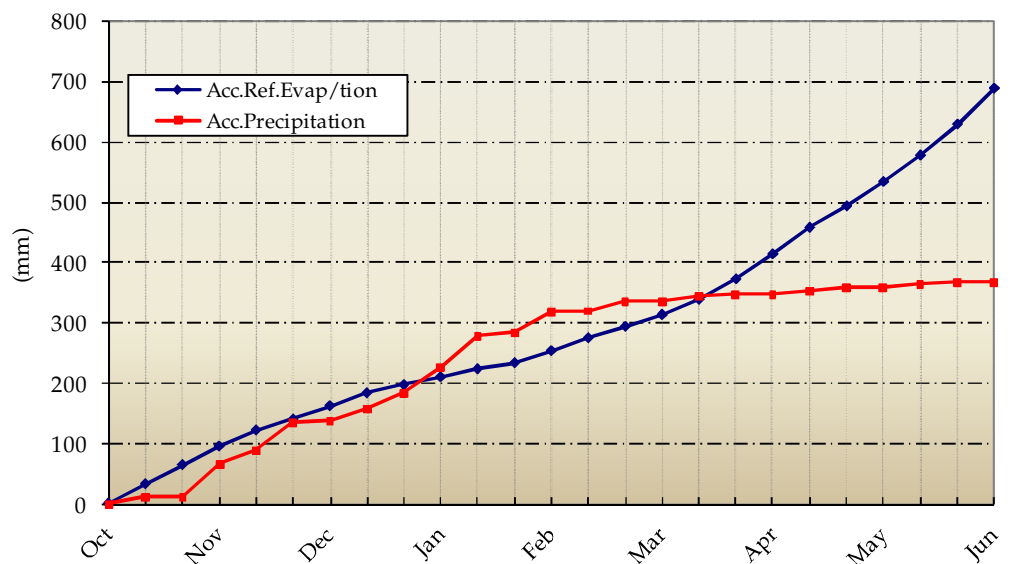


Iraklio

3rd 10-day period (21-31/05/2013)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	26.6	28.2	30.4	23.6	23.2	27.6	26.2	25.0	31.4	26.4	25.6	26.7	-	24.9
	Min	17.0	15.0	27.0	15.6	13.0	17.0	17.6	16.4	22.8	19.2	16.8	17.9	-	16.6
Relative Humidity	Max	86	75	82	83	91	72	76	79	80	83	80	81	-	-
	Min	62	15	17	25	57	32	36	31	31	49	39	36	-	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sunshine Duration		9.4	11.4	6.0	12.4	12.8	12.9	12.8	8.3	9.5	10.2	12.3	10.7	-	10.1
Precipitation														-	4.4
Evaporation		4.4	10.6	5.8	4.7	5.8	6.9	3.6	9.9	2.8	7.1	7.4	69.0	-	74.4
Growing Degrees	5	16.8	16.6	23.7	14.6	13.1	17.3	16.9	15.7	22.1	17.8	16.2	190.8	-	173.1
	10	11.8	11.6	18.7	9.6	8.1	12.3	11.9	10.7	17.1	12.8	11.2	135.8	-	118.1

3rd 10-day period (21-31/05/2013)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	59.6	-	-
Precipitation - Reference Evapotranspiration	-59.6	-	4.4
Number of Rainy Days	0.0	-	0.7
Number of Dry Days	13.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

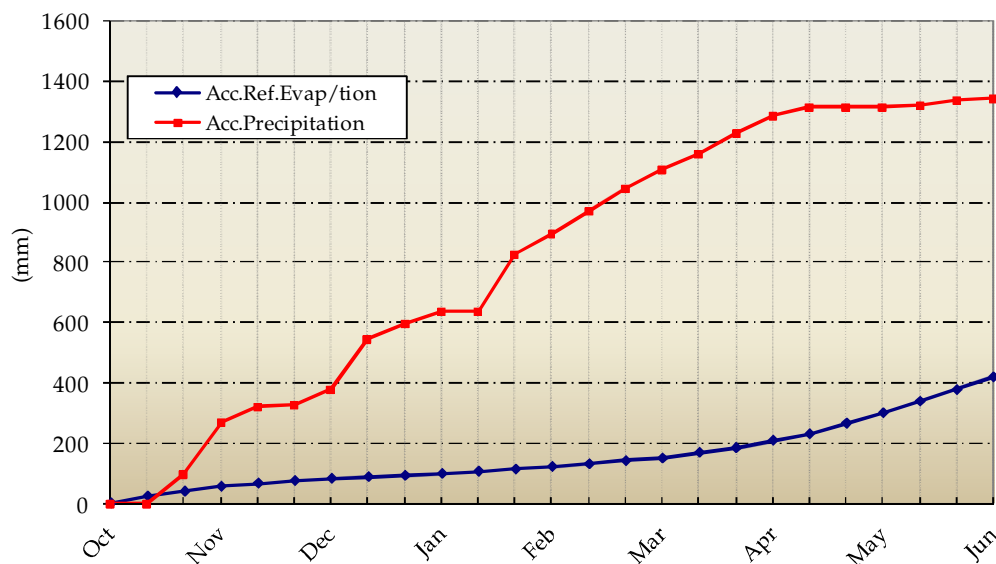


Ioannina

3rd 10-day period (21-31/05/2013)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	30.0	26.3	23.4	20.4	21.2	20.7	21.5	24.8	27.4	23.5	19.2	23.5	20.7	24.6
	Min	8.4	15.0	14.0	12.0	11.0	11.2	6.2	4.7	14.9	13.2	10.5	11.0	11.8	10.6
Relative Humidity	Max	69	90	89	98	93	75	96	95	44	92	74	83	92	-
	Min	19	28	60	48	36	26	20	14	26	32	32	31	58	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-	17.3
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-	21.4
Sunshine Duration		11.0	3.3	0.4	6.6	6.0	9.2	12.4	6.1	9.8	6.2	11.4	7.5	4.9	8.1
Precipitation			0.0	17.9	4.0		0.0			0.0		5.8	27.7	130.0	20.9
Evaporation		-	-	-	-	-	-	-	-	-	-	-	-	-	55.4
Growing Degrees	5	14.2	15.7	13.7	11.2	11.1	11.0	8.9	9.8	16.2	13.4	9.9	134.8	123.5	138.9
	10	9.2	10.7	8.7	6.2	6.1	6.0	3.9	4.8	11.2	8.4	4.9	79.8	68.5	83.9

3rd 10-day period (21-31/05/2013)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	42.3	33.4	42.6
Precipitation - Reference Evapotranspiration	-14.6	96.6	-21.7
Number of Rainy Days	3.0	9.0	3.4
Number of Dry Days	6.0	4.0	-

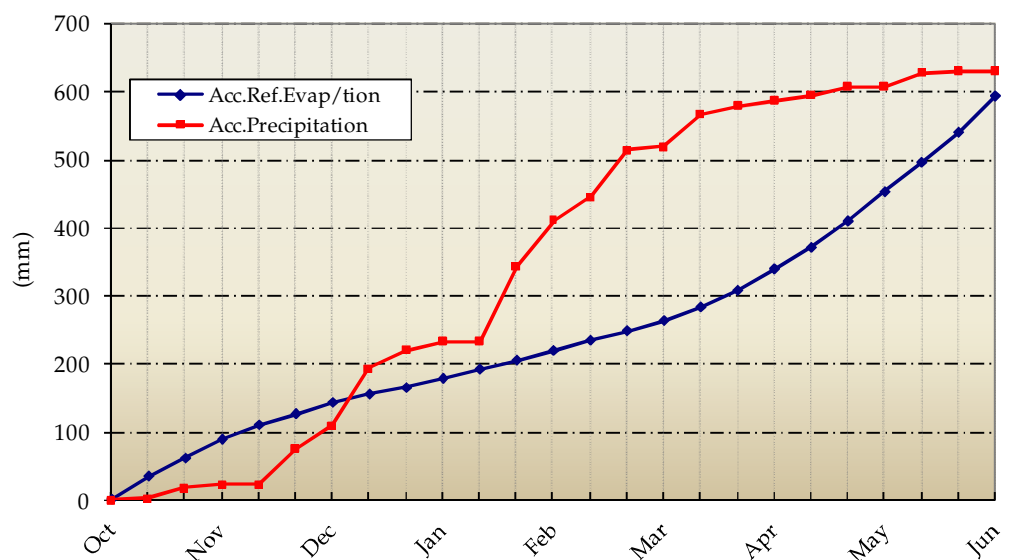
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



3rd 10-day period (21-31/05/2013)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	31.6	27.5	22.5	24.7	27.2	25.4	28.0	27.6	29.3	28.0	25.9	27.1	24.9	26.1
	Min	15.4	15.8	16.8	15.6	11.2	9.8	12.7	10.6	20.2	14.8	12.0	14.1	13.3	13.4
Relative Humidity	Max	73	72	87	91	93	90	86	83	86	92	88	86	93	-
	Min	22	31	60	42	28	31	20	21	35	27	29	31	43	-
Soil Temperature at 10 cm	06 UTC	20.6	20.8	20.8	20.2	19.4	19.4	19.6	19.6	20.6	20.6	20.2	20.2	19.7	20.5
	12 UTC	23.0	22.4	21.4	22.4	22.0	21.8	21.8	21.4	22.4	23.2	23.2	22.3	22.4	24.4
Sunshine Duration		10.5	4.6	1.6	9.4	12.3	12.5	12.8	3.3	1.4	12.0	12.8	8.5	9.6	9.6
Precipitation				0.0									0.0	6.7	3.4
Evaporation		10.6	2.8	2.4	4.8	8.8	5.6	5.8	7.2	7.2	4.8	9.8	69.8	65.7	68.8
Growing Degrees	5	18.5	16.7	14.7	15.2	14.2	12.6	15.4	14.1	19.8	16.4	14.0	171.3	155.1	162.7
	10	13.5	11.7	9.7	10.2	9.2	7.6	10.4	9.1	14.8	11.4	9.0	116.3	100.1	107.7

3rd 10-day period (21-31/05/2013)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	53.3	49.9	49.3
Precipitation - Reference Evapotranspiration	-53.3	-43.2	-45.9
Number of Rainy Days	0.0	1.0	1.1
Number of Dry Days	14.0	5.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

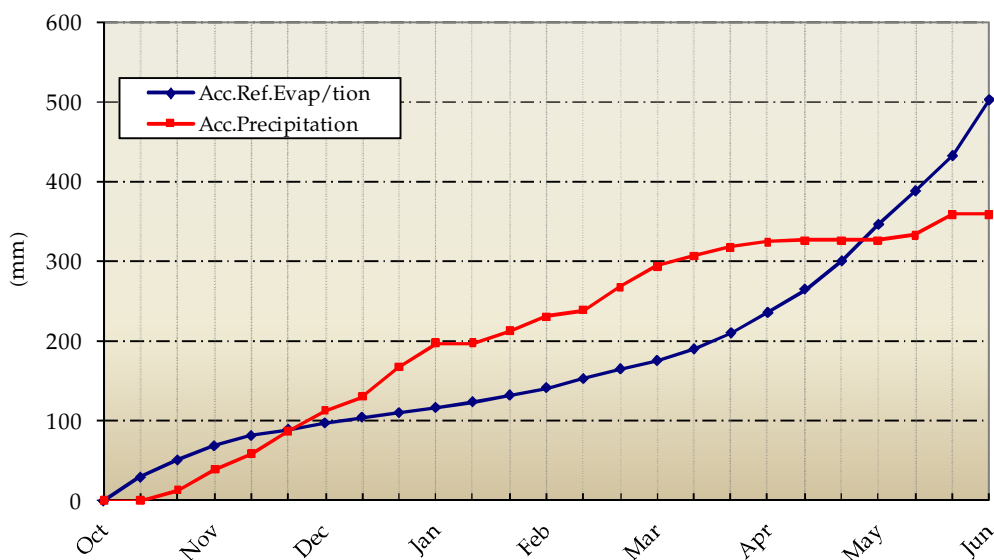


Larisa

3rd 10-day period (21-31/05/2013)		21	22	23	24	25	26	27	28	29	30	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	33.0	33.3	30.6	27.2	27.9	28.8	27.6	27.8	28.8	32.2	26.8	29.5	24.8	27.7
	Min	13.0	16.2	19.4	15.6	11.6	14.6	10.6	8.6	18.0	14.8	16.4	14.4	13.0	12.6
Relative Humidity	Max	74	72	72	65	69	58	57	71	75	71	53	67	97	-
	Min	11	13	13	25	21	17	13	14	21	17	18	17	39	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	18.2	20.0
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	19.4	22.3
Sunshine Duration		6.2	6.2	10.7	11.5	11.0	12.7	13.0	7.3	11.6	12.2	12.7	10.5	7.6	8.8
Precipitation					0.0					0.0			0.0	48.9	17.2
Evaporation		8.8	11.0	10.8	12.8	12.9	13.7	6.7	12.2	10.8	11.1	6.8	117.6	47.2	67.8
Growing Degrees	5	18.0	19.8	20.0	16.4	14.8	16.7	14.1	13.2	18.4	18.5	16.6	186.4	153.1	166.2
	10	13.0	14.8	15.0	11.4	9.8	11.7	9.1	8.2	13.4	13.5	11.6	131.4	98.1	111.2

3rd 10-day period (21-31/05/2013)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	70.1	44.4	50.4
Precipitation - Reference Evapotranspiration	-70.1	4.5	-33.2
Number of Rainy Days	0.0	6.0	3.0
Number of Dry Days	14.0	5.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

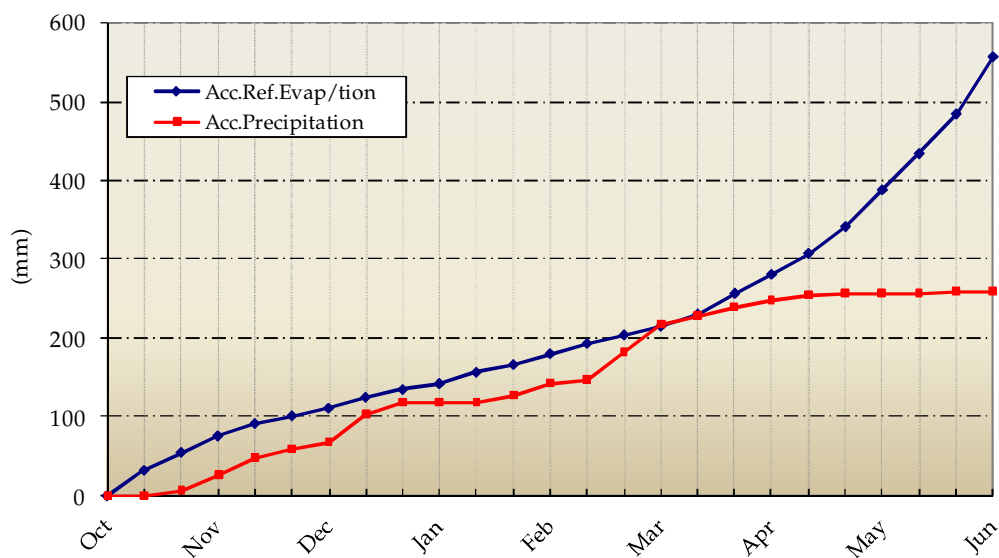


Mikra

3rd 10-day period (21-31/05/2013)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	31.8	31.0	30.6	27.5	28.8	30.1	25.8	26.8	28.4	31.1	27.6	29.0	23.6	26.2
	Min	15.0	17.0	21.4	21.4	13.8	17.0	10.8	11.0	15.8	16.0	19.4	16.2	13.6	13.9
Relative Humidity	Max	82	78	64	59	68	58	61	70	77	60	49	66	88	-
	Min	14	27	22	22	18	18	18	20	22	16	19	20	45	-
Soil Temperature at 10 cm	06 UTC	24.6	25.8	26.0	26.2	25.2	25.4	24.8	24.0	24.4	25.4	26.2	25.3	19.7	20.7
	12 UTC	30.4	30.6	28.8	30.6	30.8	31.0	31.4	31.4	31.6	32.0	32.0	31.0	23.4	25.4
Sunshine Duration		12.2	5.7	10.2	12.7	12.7	12.8	13.5	7.7	11.5	10.9	11.7	11.1	7.0	8.3
Precipitation					0.0					0.0		0.0	0.0	16.0	16.2
Evaporation		11.2	7.3	13.5	6.2	8.9	11.9	8.2	10.2	6.6	8.0	11.8	103.8	60.9	70.6
Growing Degrees	5	18.4	19.0	21.0	19.5	16.3	18.6	13.3	13.9	17.1	18.6	18.5	194.1	150.1	165.0
	10	13.4	14.0	16.0	14.5	11.3	13.6	8.3	8.9	12.1	13.6	13.5	139.1	95.1	110.0

3rd 10-day period (21-31/05/2013)	Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	72.3	44.5
Precipitation - Reference Evapotranspiration	-72.3	-28.5
Number of Rainy Days	0.0	6.0
Number of Dry Days	18.0	3.0

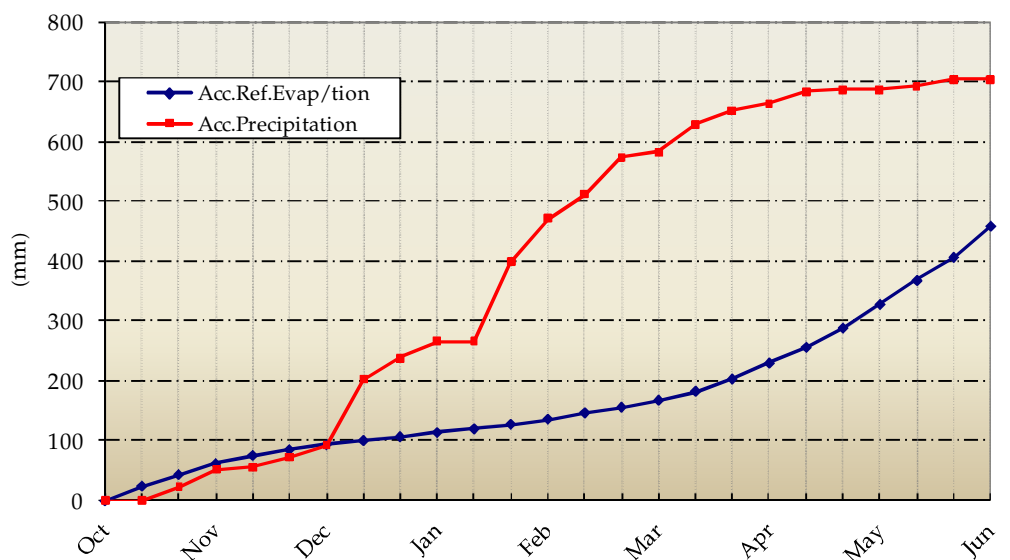
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



3rd 10-day period (21-31/05/2013)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	29.5	27.5	22.7	20.7	24.4	23.9	24.6	24.3	28.0	27.6	21.6	25.0	21.5	24.8
	Min	8.6	12.5	14.8	12.6	5.8	10.4	7.0	5.2	11.9	11.2	13.6	10.3	9.1	9.2
Relative Humidity	Max	45	76	62	66	52	47	71	75	71	70	53	63	84	-
	Min	16	24	53	44	23	24	13	18	26	16	26	26	40	-
Soil Temperature at 10 cm	06 UTC	21.6	22.6	22.0	20.0	19.0	20.8	20.6	20.8	20.8	22.8	23.2	21.3	17.7	18.5
	12 UTC	29.6	28.2	26.4	23.4	28.0	28.4	27.8	26.0	29.2	30.2	29.2	27.9	22.9	21.5
Sunshine Duration		11.6	5.4	11.0	8.5	13.1	13.3	13.2	4.7	11.8	13.1	13.3	10.8	9.2	8.9
Precipitation														11.1	11.3
Evaporation		7.3	5.6	5.6	2.8	7.2	7.9	8.8	5.1	6.9	7.8	8.9	73.9	49.4	48.7
Growing Degrees	5	14.1	15.0	13.8	11.7	10.1	12.2	10.8	9.8	15.0	14.4	12.6	139.2	113.4	132.1
	10	9.1	10.0	8.8	6.7	5.1	7.2	5.8	4.8	10.0	9.4	7.6	84.2	58.4	77.1

3rd 10-day period (21-31/05/2013)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	52.1	43.4	47.0
Precipitation - Reference Evapotranspiration	-52.1	-32.3	-35.7
Number of Rainy Days	0.0	2.0	2.6
Number of Dry Days	14.0	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.

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

Division of Climatology-Applications

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