



AGROMETEOROLOGICAL BULLETIN

May 2009
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



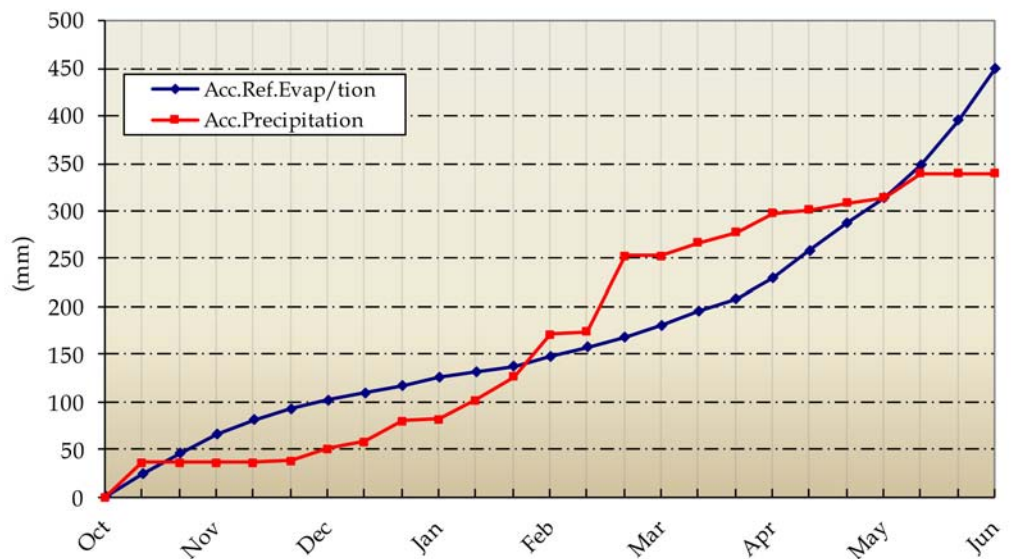
Hellenic National Meteorological Service
Division of Climatology-Applications
El. Venizelou Street 14, 16777
Helliniko, Athens

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

3rd 10-day period (21-31/05/2009)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	27.0	27.0	24.8	29.0	26.4	24.6	25.8	26.2	22.6	25.4	27.0	26.0	-	24.2
	Min	14.6	13.6	14.2	14.4	14.0	13.8	10.0	10.4	11.2	14.2	12.8	13.0	-	12.7
Relative Humidity	Max	77	87	86	85	85	79	85	72	89	89	80	83	-	-
	Min	28	41	52	35	47	30	23	28	42	42	38	37	-	-
Soil Temperature at 10 cm	06 UTC	21.2	21.4	22.0	22.6	22.6	22.4	21.6	21.4	21.5	21.0	21.6	21.8	-	19.3
	12 UTC	24.6	25.6	26.0	26.6	26.4	26.0	25.4	25.6	25.2	24.6	25.2	25.6	-	23.6
Sunshine Duration		13.2	13.5	13.3	12.0	12.5	7.2	13.6	13.6	7.3	11.7	13.1	11.9	-	8.3
Precipitation											0.4		0.4	-	12.4
Evaporation		8.5	9.4	13.9	7.1	7.4	5.9	8.3	11.1	8.0	9.6	7.8	97.0	-	70.1
Growing Degrees	5	15.8	15.3	14.5	16.7	15.2	14.2	12.9	13.3	11.9	14.8	14.9	159.5	-	147.7
	10	10.8	10.3	9.5	11.7	10.2	9.2	7.9	8.3	6.9	9.8	9.9	104.5	-	92.7

3rd 10-day period (21-31/05/2009)	Previous Year Value	Past Years Mean Value	
Reference Evapotranspiration	54.1	-	45.7
Precipitation - Reference Evapotranspiration	-53.7	-	-33.3
Number of Rainy Days	1.0	-	2.4
Number of Dry Days	16.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

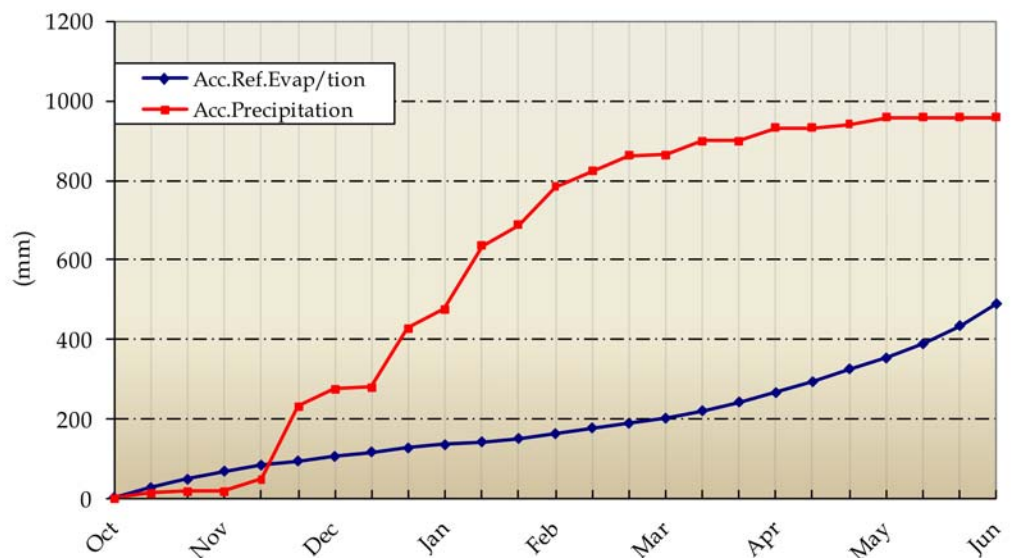


Andravida

3rd 10-day period (21-31/05/2009)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	28.8	28.0	27.0	30.0	29.0	31.0	29.6	27.0	26.0	26.4	26.6	28.1	-	25.4
	Min	14.0	13.2	14.0	16.2	16.8	17.0	17.8	16.6	16.0	18.6	15.6	16.0	-	14.0
Relative Humidity	Max	98	91	92	96	100	98	84	92	92	94	96	94	-	-
	Min	32	33	49	45	47	36	33	41	53	53	46	43	-	-
Soil Temperature at 10 cm	06 UTC	22.4	22.0	22.2	23.8	24.6	24.8	24.8	24.4	24.0	24.2	24.4	23.8	-	21.4
	12 UTC	30.2	26.0	30.2	30.4	33.2	33.6	33.0	30.2	30.4	30.6	30.8	30.8	-	25.8
Sunshine Duration		12.8	12.2	12.2	12.8	12.1	12.9	9.8	12.4	12.2	10.4	11.6	11.9	-	10.2
Precipitation														-	6.8
Evaporation		10.0	5.2	4.8	11.0	11.7	6.7	7.0	5.0	11.6	6.7	5.9	85.6	-	63.7
Growing Degrees	5	16.4	15.6	15.5	18.1	17.9	19.0	18.7	16.8	16.0	17.5	16.1	187.6	-	161.7
	10	11.4	10.6	10.5	13.1	12.9	14.0	13.7	11.8	11.0	12.5	11.1	132.6	-	106.7

3rd 10-day period (21-31/05/2009)	Previous Year Value	Past Years Mean Value	
Reference Evapotranspiration	55.4	-	48.0
Precipitation - Reference Evapotranspiration	-55.4	-	-41.2
Number of Rainy Days	0.0	-	1.0
Number of Dry Days	33.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

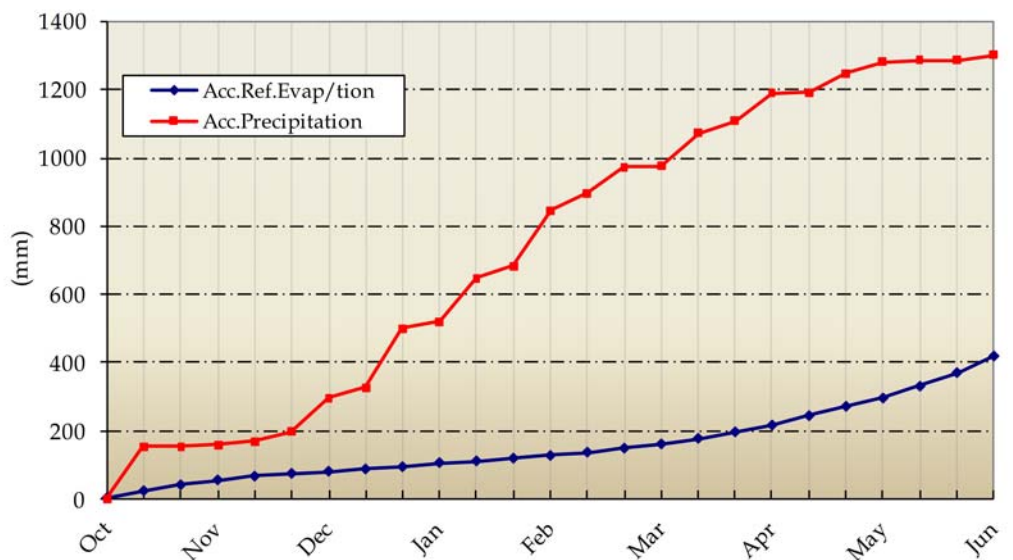


Arta

3rd 10-day period (21-31/05/2009)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	32.0	30.4	29.2	34.0	30.4	32.0	30.2	29.4	27.0	26.8	28.2	30.0	-	26.2
	Min	14.0	14.0	14.0	16.4	16.6	16.8	18.0	17.0	16.4	16.6	15.0	15.9	-	13.5
Relative Humidity	Max	96	96	98	98	99	91	96	98	98	95	90	96	-	-
	Min	17	17	38	14	35	22	23	20	44	34	23	26	-	-
Soil Temperature at 10 cm	06 UTC	22.4	22.6	23.0	24.0	24.6	23.8	24.4	23.8	23.6	24.0	23.0	23.6	-	21.1
	12 UTC	25.6	25.6	25.8	26.8	27.4	26.6	27.0	26.0	25.8	25.4	25.4	26.1	-	26.4
Sunshine Duration		12.4	12.3	10.9	12.7	10.4	10.1	6.8	10.3	8.8	8.3	11.1	10.4	-	9.1
Precipitation						13.8	0.3	0.6			1.4		16.1	-	13.7
Evaporation		5.0	6.4	6.6	6.1	11.5	5.9	4.1	7.0	4.4	4.7	6.2	67.9	-	-
Growing Degrees	5	18.0	17.2	16.6	20.2	18.5	19.4	19.1	18.2	16.7	16.7	16.6	197.2	-	163.6
	10	13.0	12.2	11.6	15.2	13.5	14.4	14.1	13.2	11.7	11.7	11.6	142.2	-	108.6

3rd 10-day period (21-31/05/2009)	Previous Year Value	Past Years Mean Value	
Reference Evapotranspiration	49.2	-	45.2
Precipitation - Reference Evapotranspiration	-33.1	-	-31.5
Number of Rainy Days	4.0	-	2.2
Number of Dry Days	20.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

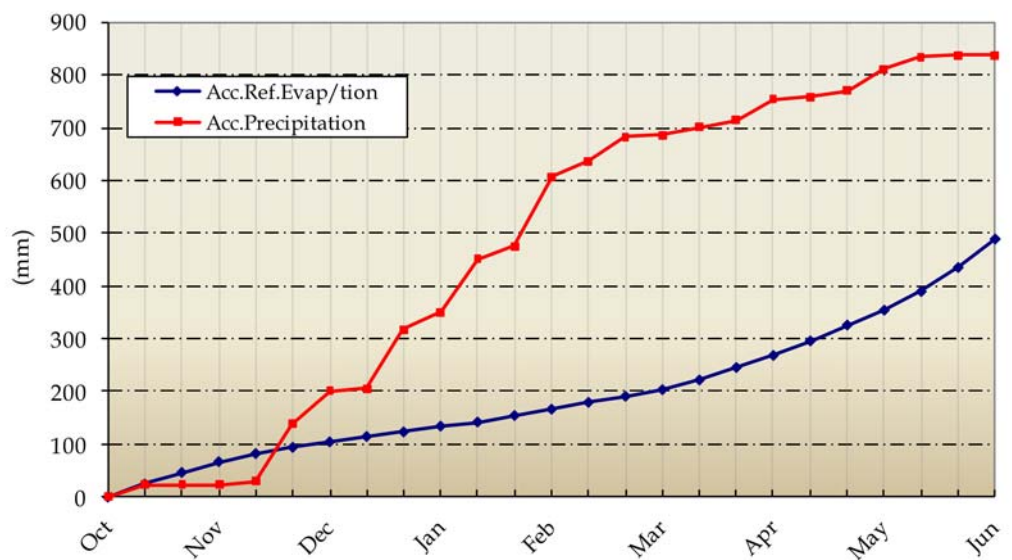


Kalamata

3rd 10-day period (21-31/05/2009)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	24.6	27.0	27.2	30.0	29.0	-	29.0	27.2	27.6	26.0	27.0	27.5	-	26.1
	Min	12.6	12.0	13.6	16.0	15.2	15.8	16.4	15.6	13.8	17.0	16.6	15.0	-	13.4
Relative Humidity	Max	96	95	100	96	94	96	94	89	93	94	90	94	-	-
	Min	43	38	50	40	46	52	43	48	38	56	48	46	-	-
Soil Temperature at 10 cm	06 UTC	19.6	19.4	19.6	20.4	20.6	21.0	21.4	21.0	21.4	21.4	21.0	20.6	-	20.5
	12 UTC	21.0	20.0	22.0	22.6	23.0	21.4	23.0	23.0	22.0	21.4	23.6	22.1	-	24.4
Sunshine Duration		11.7	11.9	12.2	12.6	12.8	12.6	10.5	11.6	11.1	11.1	13.0	11.9	-	9.6
Precipitation														-	3.4
Evaporation		6.0	6.0	7.0	6.0	5.0	11.0	7.0	7.0	8.0	4.0	4.0	71.0	-	68.8
Growing Degrees	5	13.6	14.5	15.4	18.0	17.1	-	17.7	16.4	15.7	16.5	16.8	-	-	162.7
	10	8.6	9.5	10.4	13.0	12.1	-	12.7	11.4	10.7	11.5	11.8	-	-	107.7

3rd 10-day period (21-31/05/2009)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	54.2	-	49.3
Precipitation - Reference Evapotranspiration	-54.2	-	-45.9
Number of Rainy Days	0.0	-	1.1
Number of Dry Days	13.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

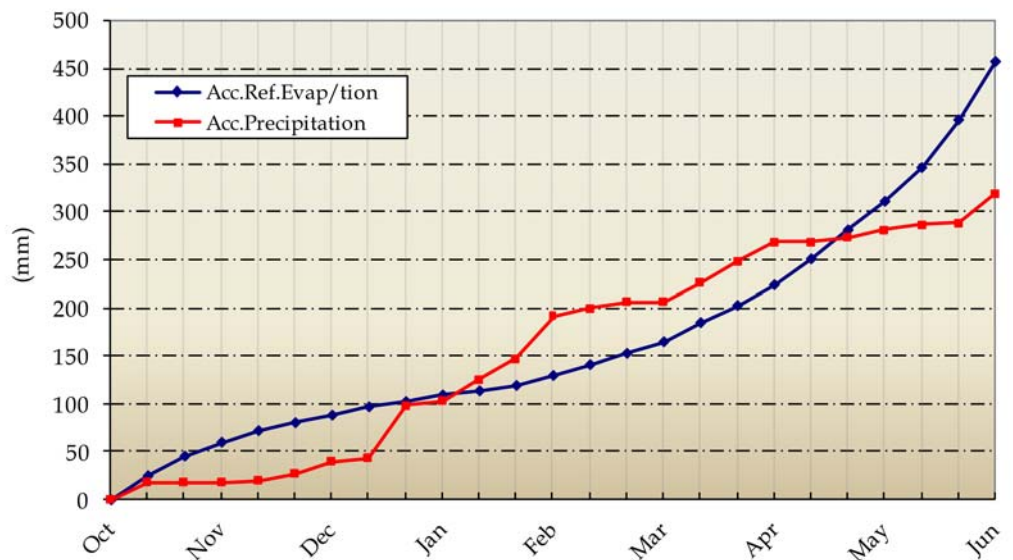


Larisa

3rd 10-day period (21-31/05/2009)		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	31.4	33.4	35.4	31.6	30.2	26.6	27.2	28.0	28.2	26.2	29.8	-	27.7
	Min	12.2	14.0	13.6	14.6	17.0	15.4	17.6	13.8	14.0	14.6	15.4	14.7	-	12.6
Relative Humidity	Max	78	83	84	89	92	94	92	96	93	92	89	89	-	-
	Min	21	28	23	16	34	31	34	43	40	42	49	33	-	-
Soil Temperature at 10 cm	06 UTC	21.0	21.6	22.0	22.0	23.0	22.6	22.8	21.4	22.0	20.8	21.4	21.9	-	20.0
	12 UTC	24.0	24.8	25.2	25.8	25.0	25.6	25.0	25.2	24.4	23.0	24.4	24.8	-	22.3
Sunshine Duration		13.1	12.5	11.3	12.3	11.3	11.5	10.8	11.3	6.5	9.3	9.6	10.9	-	8.8
Precipitation						1.9	4.0		10.8	14.6			31.3	-	17.2
Evaporation		10.1	8.0	5.9	9.1	9.6	6.6	8.5	9.9	4.0	6.8	5.1	83.6	-	67.8
Growing Degrees	5	16.1	17.7	18.5	20.0	19.3	17.8	17.1	15.5	16.0	16.4	15.8	190.2	-	166.2
	10	11.1	12.7	13.5	15.0	14.3	12.8	12.1	10.5	11.0	11.4	10.8	135.2	-	111.2

3rd 10-day period (21-31/05/2009)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	60.8	-	50.4
Precipitation - Reference Evapotranspiration	-29.5	-	-33.2
Number of Rainy Days	4.0	-	3.0
Number of Dry Days	6.0	-	-

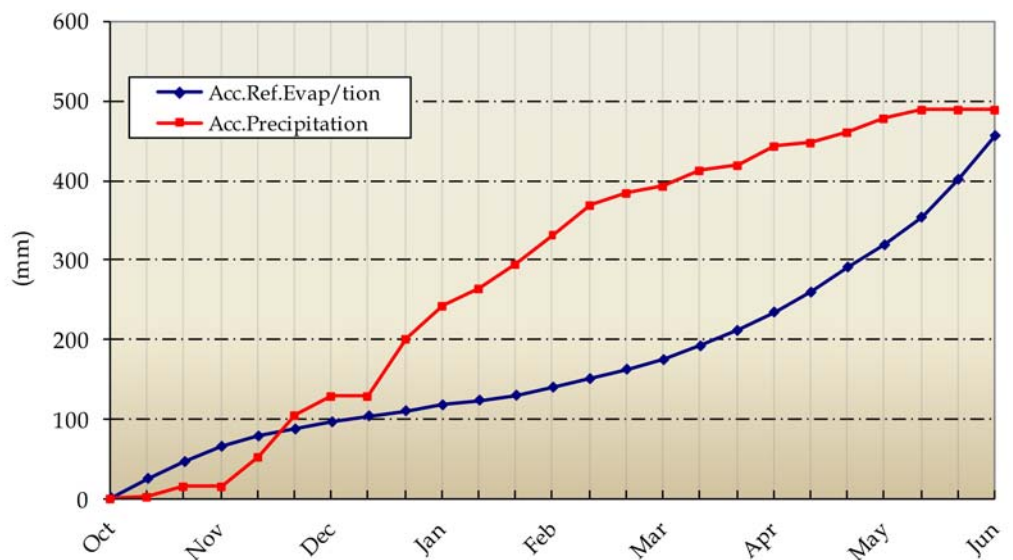
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



3rd 10-day period (21-31/05/2009)		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	30.6	30.4	33.8	36.0	31.0	-	30.2	27.2	26.6	26.0	30.2	-	27.8
	Min	14.2	13.2	11.8	13.8	15.0	15.1	12.8	11.4	12.8	16.8	14.0	13.7	-	11.5
Relative Humidity	Max	40	58	65	58	72	60	68	62	72	82	-	64	-	-
	Min	21	28	30	38	32	40	35	28	36	51	-	34	-	-
Soil Temperature at 10 cm	06 UTC	21.8	21.6	22.4	23.4	24.6	25.0	23.6	23.0	23.2	23.8	23.4	23.3	-	20.3
	12 UTC	29.2	29.8	31.2	32.6	33.4	32.2	31.0	32.6	30.8	29.4	31.2	31.2	-	28.3
Sunshine Duration		12.1	12.6	12.1	12.5	10.4	12.3	8.9	10.0	10.0	9.1	-	11.0	-	9.1
Precipitation														-	4.7
Evaporation		10.0	8.6	8.3	8.9	10.0	8.4	4.8	8.1	5.3	6.1	-	-	-	61.5
Growing Degrees	5	17.1	16.9	16.1	18.8	20.5	18.1	-	15.8	15.0	16.7	15.0	-	-	161.3
	10	12.1	11.9	11.1	13.8	15.5	13.1	-	10.8	10.0	11.7	10.0	-	-	106.3

3rd 10-day period (21-31/05/2009)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	55.0	-	46.9
Precipitation - Reference Evapotranspiration	-55.0	-	-42.2
Number of Rainy Days	0.0	-	1.8
Number of Dry Days	25.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

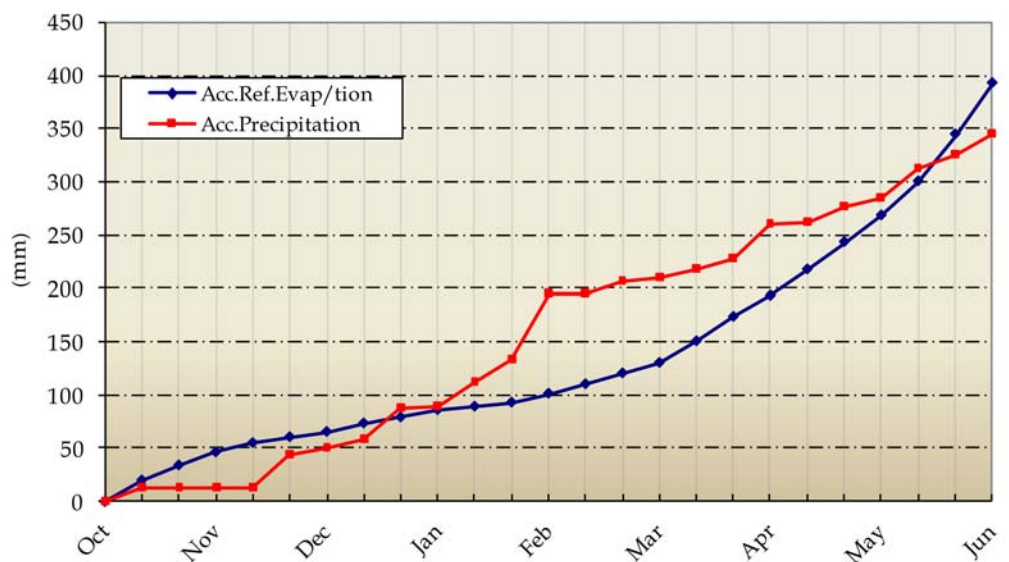


Series

3rd 10-day period (21-31/05/2009)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	30.2	32.8	34.0	34.6	31.2	31.4	30.2	29.4	24.4	23.0	-	30.1	-	26.9
	Min	14.0	14.8	15.2	15.8	17.0	17.0	18.6	16.0	15.0	14.0	14.4	15.6	-	14.1
Relative Humidity	Max	66	57	67	57	87	73	53	58	90	94	89	72	-	-
	Min	31	24	27	24	34	28	28	37	57	65	44	36	-	-
Soil Temperature at 10 cm	06 UTC	21.2	22.2	22.8	23.0	22.6	22.2	23.2	22.2	22.8	21.2	21.0	22.2	-	20.0
	12 UTC	23.8	24.8	25.2	25.6	23.6	24.4	24.4	24.2	23.0	22.0	21.4	23.9	-	23.6
Sunshine Duration		10.2	13.2	13.0	10.2	7.1	11.9	7.0	11.6	2.8	2.8	11.1	9.2	-	8.1
Precipitation						9.5				6.5	4.2		20.2	-	19.3
Evaporation		5.0	5.0	5.0	0.0	2.6	4.0	3.6	1.0	1.0	1.5	3.0	31.7	-	54.5
Growing Degrees	5	17.1	18.8	19.6	20.2	19.1	19.2	19.4	17.7	14.7	13.5	-	-	-	170.3
	10	12.1	13.8	14.6	15.2	14.1	14.2	14.4	12.7	9.7	8.5	-	-	-	115.3

3rd 10-day period (21-31/05/2009)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	48.1	-	44.2
Precipitation - Reference Evapotranspiration	-27.9	-	-24.9
Number of Rainy Days	3.0	-	3.5
Number of Dry Days	6.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

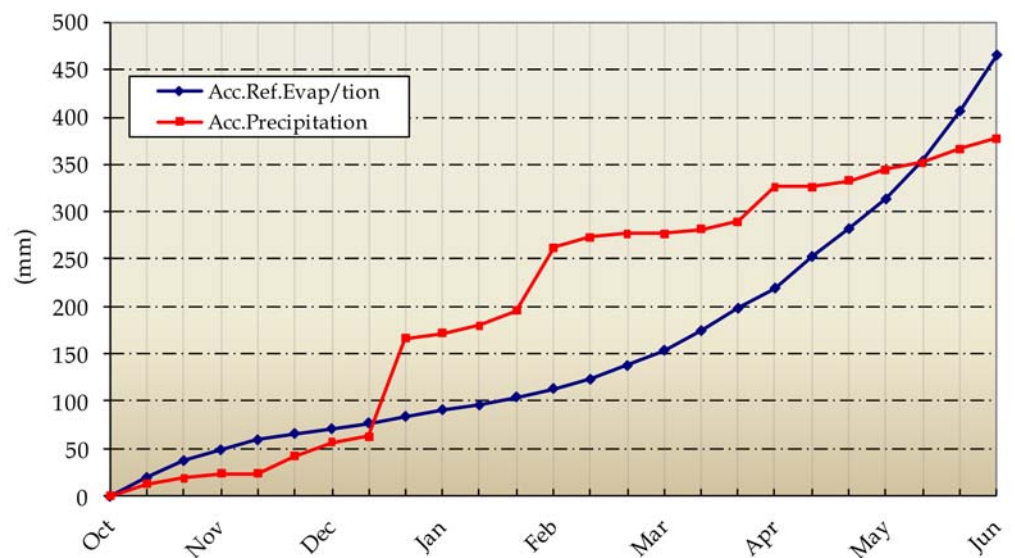


Trikala Imathias

3rd 10-day period (21-31/05/2009)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	30.4	31.0	34.4	34.4	33.2	30.2	25.6	26.4	22.8	23.6	25.6	28.9	-	26.6
	Min	15.4	16.0	16.2	17.6	17.8	17.2	18.4	15.2	11.0	12.8	12.4	15.5	-	14.1
Relative Humidity	Max	96	80	94	96	91	96	100	98	94	83	95	93	-	-
	Min	28	26	18	18	24	31	33	50	48	52	36	33	-	-
Soil Temperature at 10 cm	06 UTC	21.0	22.2	22.8	23.2	23.8	23.6	24.0	22.0	22.2	19.2	19.8	22.2	-	20.3
	12 UTC	26.0	27.0	27.2	28.0	26.8	26.6	25.8	26.2	24.0	23.2	25.0	26.0	-	22.0
Sunshine Duration		10.1	11.9	12.9	10.7	7.8	11.6	6.2	9.3	1.4	6.4	9.3	8.9	-	8.1
Precipitation						1.5			4.6	4.2			10.3	-	15.6
Evaporation		0.0	5.5	7.4	5.2	7.6	5.8	5.8	3.4	3.5	4.1	3.6	51.9	-	57.3
Growing Degrees	5	17.9	18.5	20.3	21.0	20.5	18.7	17.0	15.8	11.9	13.2	14.0	188.8	-	168.8
	10	12.9	13.5	15.3	16.0	15.5	13.7	12.0	10.8	6.9	8.2	9.0	133.8	-	113.8

3rd 10-day period (21-31/05/2009)	Previous Year Value	Past Years Mean Value	
Reference Evapotranspiration	59.1	-	46.0
Precipitation - Reference Evapotranspiration	-48.8	-	-30.4
Number of Rainy Days	3.0	-	2.9
Number of Dry Days	5.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

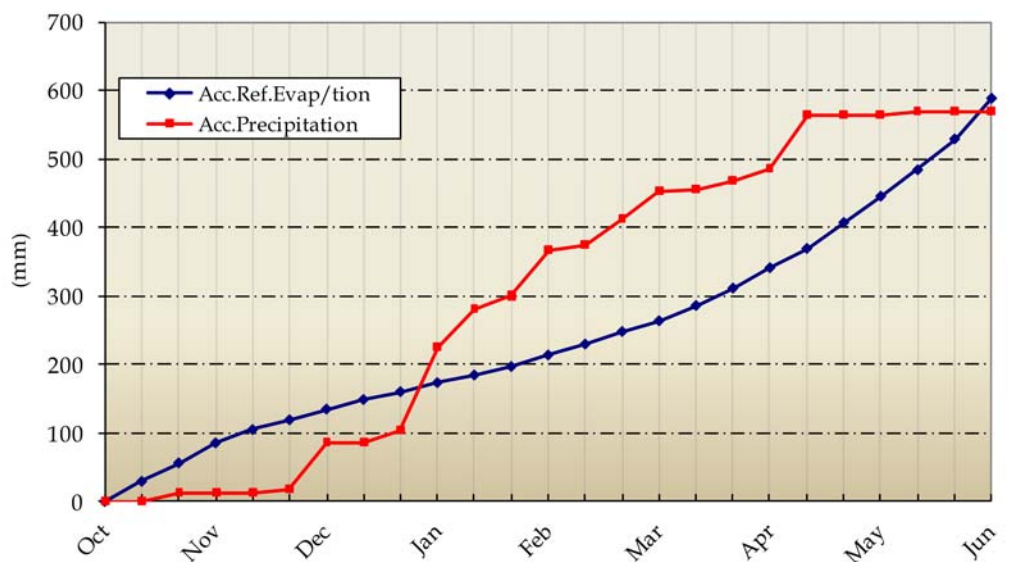


Tympaki

3rd 10-day period (21-31/05/2009)		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	27.0	23.6	32.0	33.2	29.0	29.4	27.6	25.2	25.2	25.0	27.4	-	26.1
	Min	16.4	16.0	15.0	14.4	16.6	19.4	21.4	13.8	13.0	14.8	13.6	15.9	-	15.3
Relative Humidity	Max	76	76	88	87	60	80	54	67	79	77	93	76	-	-
	Min	37	27	42	18	22	32	24	24	21	39	54	31	-	-
Soil Temperature at 10 cm	06 UTC	23.0	23.0	23.2	24.2	25.6	27.4	26.0	25.8	24.0	25.6	25.2	24.8	-	25.2
	12 UTC	27.2	29.0	30.6	31.6	33.2	34.0	33.0	31.0	31.4	30.8	32.6	31.3	-	30.3
Sunshine Duration		9.3	11.3	10.3	12.4	9.3	11.9	11.7	12.7	11.6	7.9	10.6	10.8	-	10.3
Precipitation														-	1.4
Evaporation		11.0	11.0	8.0	9.0	12.1	9.4	9.7	12.1	9.9	7.5	5.9	105.6	-	83.8
Growing Degrees	5	15.2	16.5	14.3	18.2	19.9	19.2	20.4	15.7	14.1	15.0	14.3	182.8	-	172.9
	10	10.2	11.5	9.3	13.2	14.9	14.2	15.4	10.7	9.1	10.0	9.3	127.8	-	117.9

3rd 10-day period (21-31/05/2009)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	59.5	-	52.3
Precipitation - Reference Evapotranspiration	-59.5	-	-50.9
Number of Rainy Days	0.0	-	0.6
Number of Dry Days	27.0	-	-

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

© HELLENIC NATIONAL METEOROLOGICAL SERVICE

Reproduction is prohibited without written permission

El. Venizelou street 14, Zip Code 16777

Helliniko, Athens



ΕΘΝΙΚΗ
ΜΕΤΕΩΡΟΛΟΓΙΚΗ
ΥΠΗΡΕΣΙΑ

HELLENIC NATIONAL METEOROLOGICAL SERVICE

Division of Climatology-Applications

Issue Editors :

Charalabopoulos Christos

Filiou Anna

The present bulletin was designed and implemented under the support of Water Resources Management Division of Agriculture University of Athens (Professor A. Liakatas)