AGROMETEOROLOGICAL BULLETIN

July 2014
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
El. Venizelou Street 14, 16777
Helliniko, Athens

Web adresses of HNMS
www.emy.gr
www.emy.gov.gr
www.meteo.gov.gr
www.meteohellas.gr

Agrometeorological Data July 2014

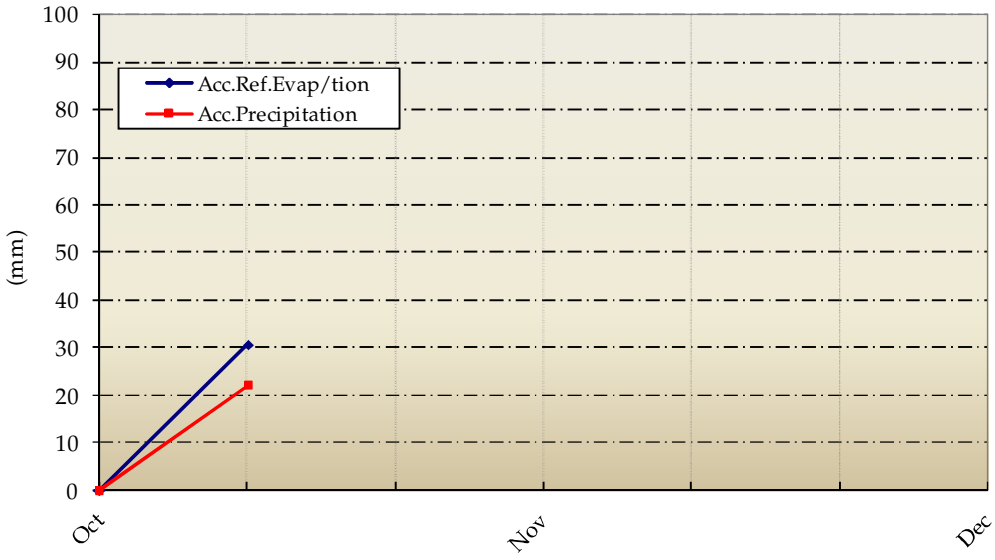
Agrinio

2nd 10-day period (11-20/07/2014)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max													
	Min													
Relative Humidity	Max													
	Min													
Soil Tempera-ture at 10 cm	06 UTC													
	12 UTC													
Sunshine Duration														
Precipitation														
Evaporation														
Growing Degrees	5													
	10													

2nd 10-day period (11-20/07/2014)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration			
Precipitation - Reference Evapotranspiration			
Number of Rainy Days			
Number of Dry Days			

This station is not operated

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

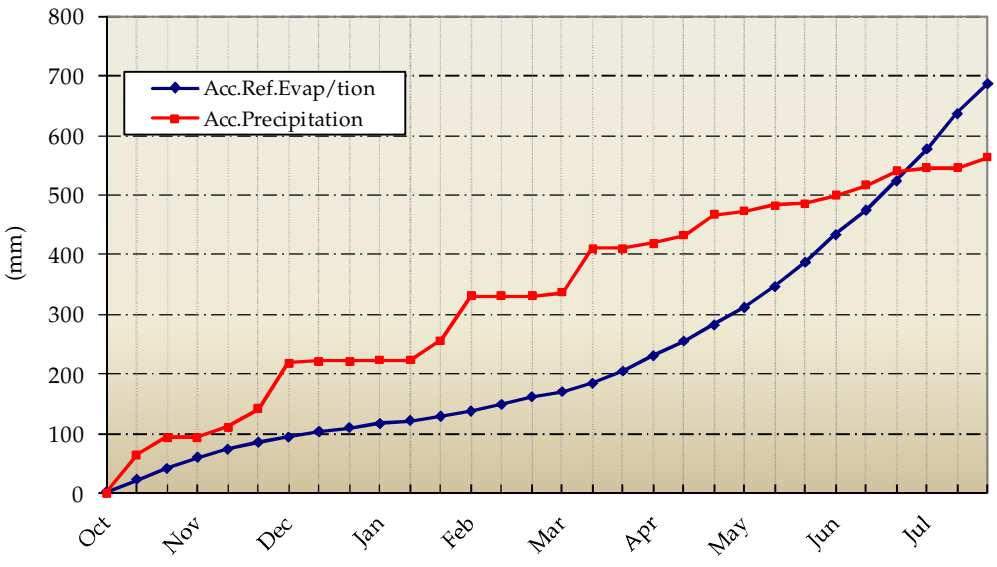


Alexandroupoli

2nd 10-day period (11-20/07/2014)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	29.8	28.4	29.6	30.8	31.0	26.4	29.0	30.2	28.4	32.0	29.6	31.0	30.5
	Min	18.8	20.2	18.0	18.6	19.6	18.4	19.6	18.4	19.0	19.4	19.0	20.0	17.5
Relative Humidity	Max	94	84	86	87	76	91	88	89	90	91	88	70	-
	Min	48	53	48	32	32	58	44	41	50	34	44	32	-
Soil Temperature at 10 cm	06 UTC	27.4	27.6	27.2	27.5	27.4	25.4	24.8	25.6	23.5	24.4	26.1	27.2	24.2
	12 UTC	32.4	32.2	32.0	31.8	32.4	27.6	30.0	30.0	27.4	30.4	30.6	30.6	28.8
Sunshine Duration		12.9	10.2	13.1	12.2	9.0	4.8	10.8	6.9	8.5	12.4	10.1	12.2	11.2
Precipitation							7.7		8.4			16.1	0.0	5.1
Evaporation		10.0	7.3	8.9	8.2	8.6	5.9	8.7	7.4	6.2	7.3	78.5	93.2	98.7
Growing Degrees	5	19.3	19.3	18.8	19.7	20.3	17.4	19.3	19.3	18.7	20.7	192.8	205.0	190.1
	10	14.3	14.3	13.8	14.7	15.3	12.4	14.3	14.3	13.7	15.7	142.8	155.0	140.1

2nd 10-day period (11-20/07/2014)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	50.7	60.3	60.3
Precipitation - Reference Evapotranspiration	-34.6	-60.3	-55.2
Number of Rainy Days	2.0	0.0	0.9
Number of Dry Days	20.0	19.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



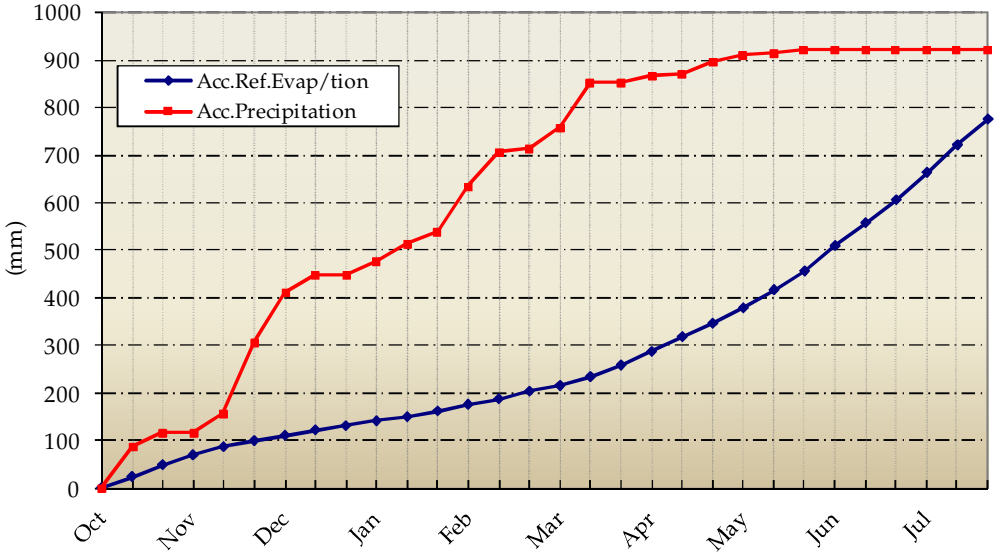
Agrometeorological Data July 2014

Andravida

2nd 10-day period (11-20/07/2014)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	27.9	27.8	28.2	29.0	27.6	28.0	29.8	29.4	30.1	31.4	28.9	29.5	30.4
	Min	18.4	16.4	17.2	18.8	19.0	17.9	19.6	19.8	19.5	20.3	18.7	18.5	18.1
Relative Humidity	Max	88	85	88	90	86	86	87	88	89	88	88	87	-
	Min	35	35	43	44	44	48	44	47	46	39	42	44	-
Soil Temperature at 10 cm	06 UTC	28.2	26.0	26.0	26.6	28.0	26.6	27.8	28.0	28.4	29.0	27.5	28.1	27.1
	12 UTC	32.2	32.0	32.0	33.0	31.0	30.8	33.2	33.0	33.0	33.5	32.4	34.6	31.8
Sunshine Duration		9.4	13.7	13.8	12.3	7.8	13.3	13.1	13.1	12.0	13.0	12.2	12.6	12.3
Precipitation						0.1						0.1		0.8
Evaporation		4.0	8.0	8.2	6.8	8.1	0.0	7.0	13.0	7.0	8.4	70.5	83.7	77.4
Growing Degrees	5	18.2	17.1	17.7	18.9	18.3	18.0	19.7	19.6	19.8	20.9	188.1	190.0	192.4
	10	13.2	12.1	12.7	13.9	13.3	13.0	14.7	14.6	14.8	15.9	138.1	140.0	142.4

2nd 10-day period (11-20/07/2014)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	54.3	55.6	55.3
Precipitation - Reference Evapotranspiration	-54.2	-55.6	-54.5
Number of Rainy Days	1.0	0.0	0.1
Number of Dry Days	35.0	40.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



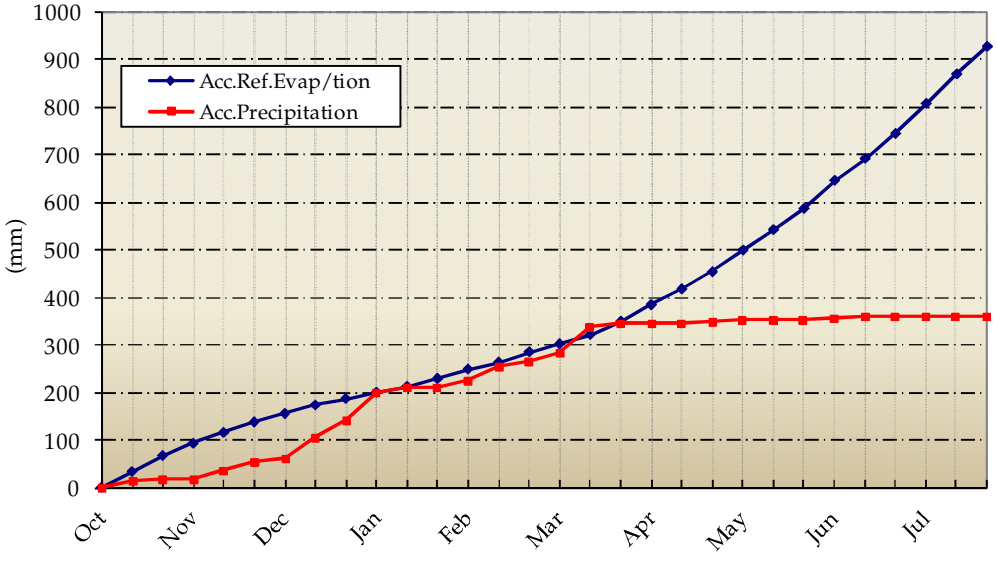
Agrometeorological Data — July 2014

Iraklio

2nd 10-day period (11-20/07/2014)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	32.0	31.0	27.8	28.0	28.0	27.2	27.5	27.4	28.2	28.2	28.5	28.9	28.5
	Min	23.0	21.2	20.0	20.0	22.0	22.4	21.2	20.4	20.6	24.4	21.5	23.4	22.1
Relative Humidity	Max	88	79	80	76	78	83	89	89	82	79	82	75	-
	Min	40	54	48	53	51	63	69	63	60	65	57	55	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
Sunshine Duration		9.9	12.8	12.9	12.9	12.9	10.5	12.4	12.6	12.7	11.5	12.1	12.4	12.1
Precipitation														0.0
Evaporation		2.6	9.9	7.0	8.4	5.9	5.8	5.5	1.2	11.9	6.1	64.3	78.4	93.8
Growing Degrees	5	22.5	21.1	18.9	19.0	20.0	19.8	19.4	18.9	19.4	21.3	200.3	211.2	203.0
	10	17.5	16.1	13.9	14.0	15.0	14.8	14.4	13.9	14.4	16.3	150.3	161.2	153.0

2nd 10-day period (11-20/07/2014)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	57.8	64.0	-
Precipitation - Reference Evapotranspiration	-57.8	-64.0	0.0
Number of Rainy Days	0.0	0.0	0.0
Number of Dry Days	45.0	63.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



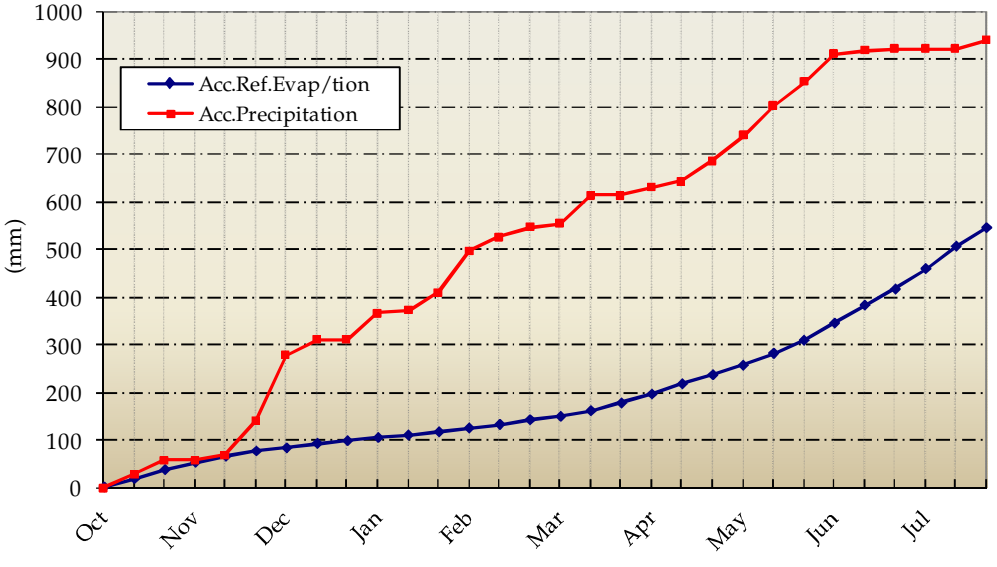
Agrometeorological Data — July 2014

Ioannina

2nd 10-day period (11-20/07/2014)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	25.2	26.5	28.8	28.9	24.3	27.2	29.9	28.6	31.4	31.2	28.2	30.9	31.4
	Min	16.1	11.4	11.0	18.6	16.2	12.7	18.0	12.9	17.6	15.6	15.0	14.2	15.3
Relative Humidity	Max	94	74	72	98	100	85	100	99	100	100	92	84	-
	Min	49	39	31	30	49	41	32	35	31	38	38	26	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	23.4
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	27.8
Sunshine Duration		10.0	12.0	11.1	9.8	3.5	7.9	8.0	6.3	8.2	10.4	8.7	10.1	10.3
Precipitation		6.5				4.4	0.2	0.5	6.2	0.0	0.0	17.8	4.4	13.3
Evaporation		-	-	-	-	-	-	-	-	-	-	-	-	83.3
Growing Degrees	5	15.7	14.0	14.9	18.8	15.3	15.0	19.0	15.8	19.5	18.4	166.1	175.3	178.2
	10	10.7	9.0	9.9	13.8	10.3	10.0	14.0	10.8	14.5	13.4	116.1	125.3	129.5

2nd 10-day period (11-20/07/2014)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	39.0	49.2	50.5
Precipitation - Reference Evapotranspiration	-21.2	-44.8	-37.2
Number of Rainy Days	5.0	3.0	1.6
Number of Dry Days	20.0	5.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

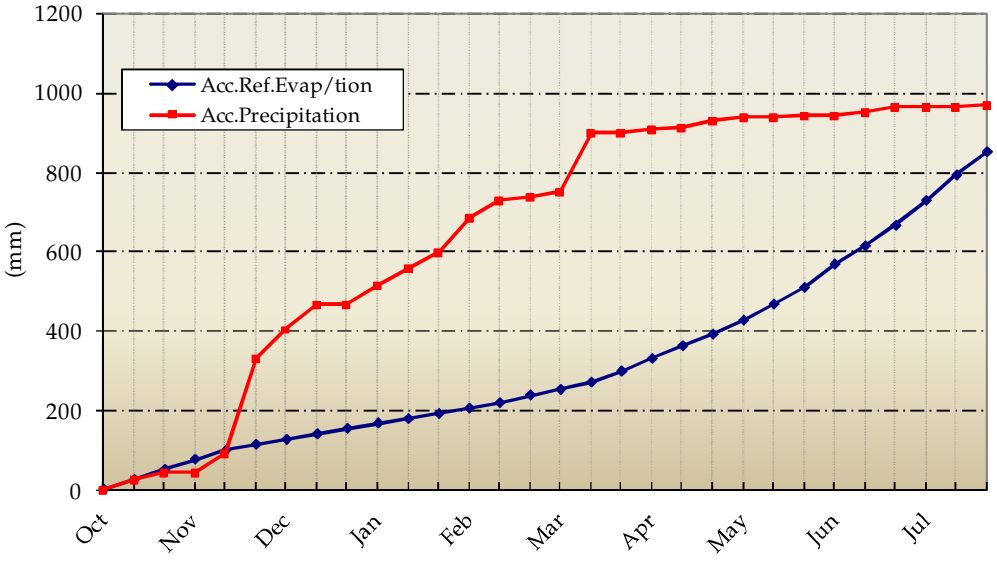


Kalamata

2nd 10-day period (11-20/07/2014)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	31.1	30.2	31.7	31.7	30.3	28.1	29.2	30.7	30.4	30.4	30.4	31.6	31.2
	Min	18.1	16.6	16.3	18.0	18.1	17.8	17.6	18.0	18.7	20.0	17.9	18.6	17.8
Relative Humidity	Max	82	86	90	89	87	90	90	91	91	92	89	85	-
	Min	34	24	24	28	30	43	43	37	37	38	34	32	-
Soil Temperature at 10 cm	06 UTC	26.0	25.4	25.4	25.6	25.4	25.6	25.6	25.6	26.0	25.4	25.6	25.1	25.6
	12 UTC	28.4	27.2	27.8	27.6	28.0	27.6	28.0	27.8	28.4	27.4	27.8	28.3	30.0
Sunshine Duration		12.2	12.7	12.5	12.6	12.1	11.5	11.7	11.9	10.1	10.2	11.8	11.6	11.5
Precipitation										2.6	3.4	6.0	8.0	3.4
Evaporation		-	-	-	-	-	-	-	-	-	-	-	93.2	87.7
Growing Degrees	5	19.6	18.4	19.0	19.9	19.2	18.0	18.4	19.4	19.6	20.2	191.5	201.5	195.0
	10	14.6	13.4	14.0	14.9	14.2	13.0	13.4	14.4	14.6	15.2	141.5	151.5	145.0

2nd 10-day period (11-20/07/2014)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	58.5	62.2	57.1
Precipitation - Reference Evapotranspiration	-52.5	-54.2	-53.7
Number of Rainy Days	2.0	1.0	0.4
Number of Dry Days	28.0	32.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



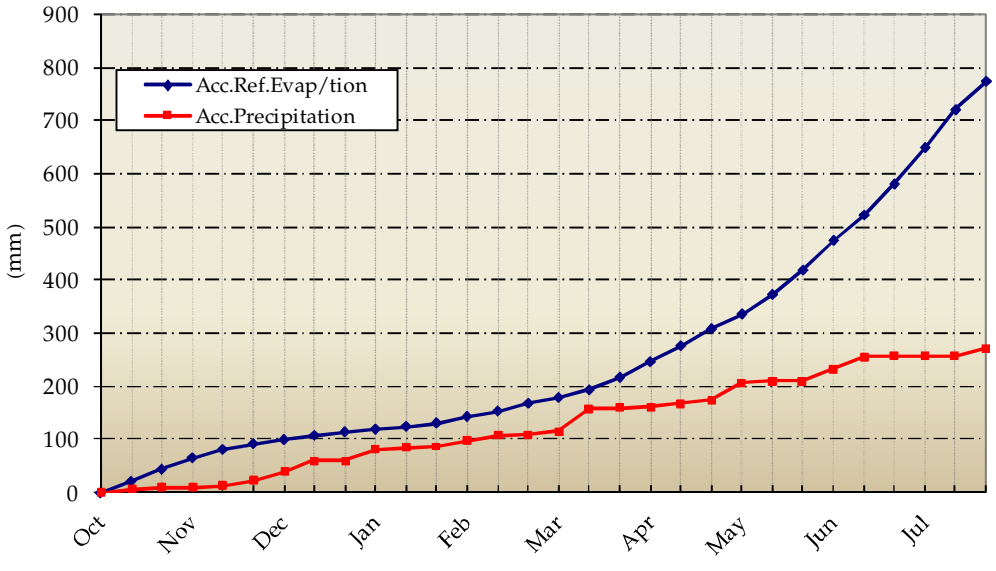
Agrometeorological Data — July 2014

Larisa

2nd 10-day period (11-20/07/2014)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	32.2	33.2	34.4	33.6	26.2	29.8	32.1	33.3	33.4	33.9	32.2	32.5	33.3
	Min	20.9	21.2	17.0	15.9	18.0	17.5	18.4	18.1	18.8	21.0	18.7	18.8	17.9
Relative Humidity	Max	44	46	69	65	98	96	92	92	91	92	78	83	-
	Min	22	17	14	17	53	34	28	26	28	68	31	24	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	26.6
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	29.2
Sunshine Duration		10.4	10.2	11.1	9.6	0.9	7.5	8.7	8.0	9.8	7.0	8.3	11.0	11.0
Precipitation						14.6	0.0					14.6	17.5	9.9
Evaporation		5.4	11.9	13.4	12.0	3.0	6.4	8.8	7.3	9.1	-	-	97.5	96.3
Growing Degrees	5	21.6	22.2	20.7	19.8	17.1	18.7	20.3	20.7	21.1	22.5	204.5	206.7	205.9
	10	16.6	17.2	15.7	14.8	12.1	13.7	15.3	15.7	16.1	17.5	154.5	156.7	155.9

2nd 10-day period (11-20/07/2014)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	53.3	58.8	62.2
Precipitation - Reference Evapotranspiration	-38.7	-41.3	-52.3
Number of Rainy Days	1.0	2.0	1.2
Number of Dry Days	30.0	12.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

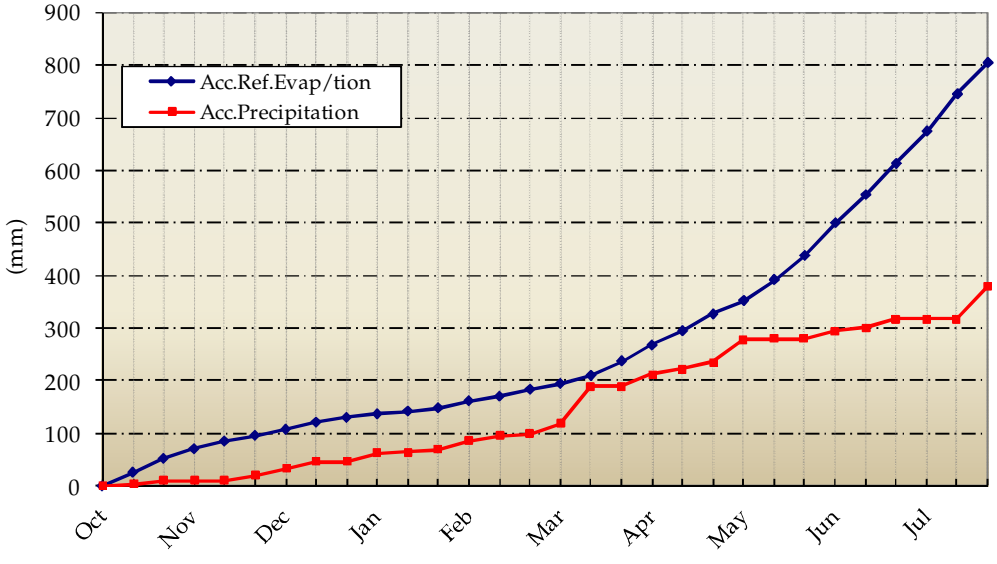


Mikra

2nd 10-day period (11-20/07/2014)		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	31.0	31.8	31.7	27.8	28.6	30.5	31.5	31.9	32.5	30.8	31.2	31.7
	Min	20.2	19.6	18.6	19.8	18.1	19.2	18.0	20.3	20.8	21.0	19.6	20.8	18.9
Relative Humidity	Max	57	55	67	71	94	87	90	80	80	80	76	69	-
	Min	29	29	24	29	57	43	36	38	32	32	35	29	-
Soil Temperature at 10 cm	06 UTC	29.0	27.6	28.2	29.0	25.8	23.8	24.0	25.2	26.2	27.0	26.6	27.9	26.6
	12 UTC	32.4	34.0	34.4	35.6	24.2	28.0	29.6	31.0	32.0	32.0	31.3	33.7	31.5
Sunshine Duration		8.7	13.5	12.7	13.0	2.6	5.4	12.8	12.7	9.3	12.3	10.3	11.6	10.8
Precipitation						61.2	0.3			0.0		61.5	13.9	4.3
Evaporation		15.4	11.8	10.8	10.8	6.3	9.7	9.6	9.0	8.0	7.8	99.2	98.7	94.9
Growing Degrees	5	20.4	20.3	20.2	20.8	18.0	18.9	19.3	20.9	21.4	21.8	201.8	210.1	203.4
	10	15.4	15.3	15.2	15.8	13.0	13.9	14.3	15.9	16.4	16.8	151.8	160.1	153.4

2nd 10-day period (11-20/07/2014)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	59.6	67.2	60.5
Precipitation - Reference Evapotranspiration	1.9	-53.3	-56.2
Number of Rainy Days	2.0	1.0	1.4
Number of Dry Days	16.0	7.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

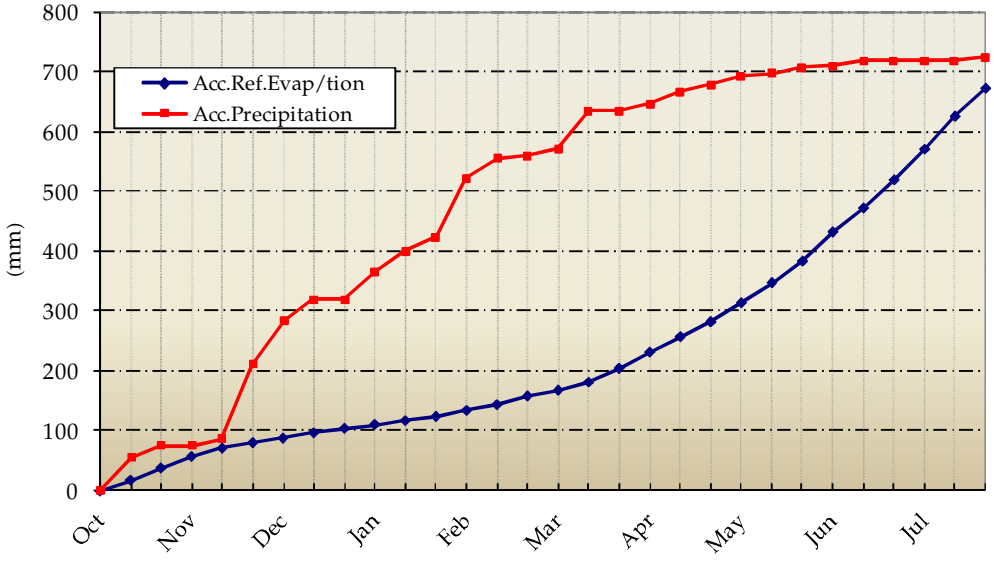


Tripoli

2nd 10-day period (11-20/07/2014)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	37.8	28.4	29.4	29.4	26.7	26.5	27.7	29.3	28.9	29.4	29.4	29.7	30.6
	Min	14.1	12.8	11.2	12.0	13.0	12.1	12.3	13.3	13.5	13.2	12.8	13.9	14.1
Relative Humidity	Max	78	79	81	86	92	89	97	98	99	99	90	81	-
	Min	27	24	23	22	29	34	33	27	35	32	29	28	-
Soil Temperature at 10 cm	06 UTC	27.8	26.8	26.4	27.0	26.6	24.8	24.8	23.0	21.6	21.6	25.0	23.0	25.3
	12 UTC	34.2	-	-	32.8	31.4	30.8	30.0	30.0	-	-	31.5	29.7	28.3
Sunshine Duration		12.6	13.4	13.3	12.9	6.9	7.1	6.9	7.6	6.2	7.6	9.4	8.7	10.5
Precipitation						0.0		2.7	2.9	1.3		6.9	4.8	9.1
Evaporation		8.8	7.9	10.5	7.7	7.7	5.2	2.7	2.9	0.4	5.7	59.5	53.8	63.7
Growing Degrees	5	21.0	15.6	15.3	15.7	14.9	14.3	15.0	16.3	16.2	16.3	160.5	168.1	173.2
	10	16.0	10.6	10.3	10.7	9.9	9.3	10.0	11.3	11.2	11.3	110.5	118.1	123.2

2nd 10-day period (11-20/07/2014)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	47.1	46.2	53.3
Precipitation - Reference Evapotranspiration	-40.2	-41.4	-44.2
Number of Rainy Days	3.0	2.0	1.4
Number of Dry Days	37.0	2.0	-

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 ^{o}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 : ^{o}C
- Relative Humidity : %
- Soil Temperature : ^{o}C
- Sunshine Duration : Hours
- Precipitation : mm
- Evaporation (Pan) : mm
- Growing Degrees : ^{o}C

UTC (Universal Time coordinates) in Greece

- Winter : Time(UTC) = Local time - 2
- Summer : Time(UTC) = Local time - 3

El. Venizelou street 14, Zip Code 16777
Helliniko, Athens

ΕΘΝΙΚΗ ΜΕΤΕΩΡΟΛΟΓΙΚΗ ΥΠΗΡΕΣΙΑ
HELLENIC NATIONAL METEOROLOGICAL SERVICE
Division of Climatology-Applications
Issue Editors :
Papakrivou Anastasia

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