



AGROMETEOROLOGICAL BULLETIN

August 2012
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



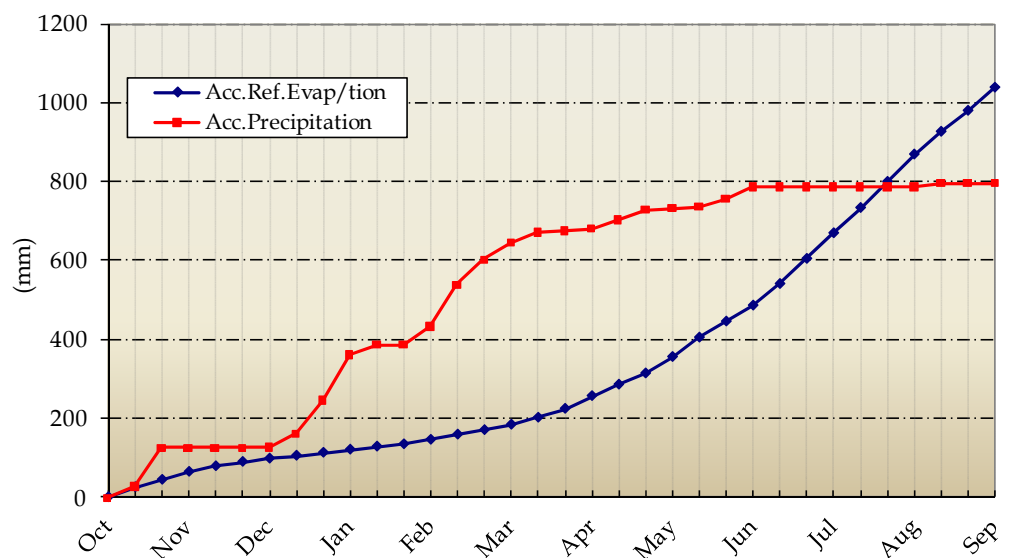
Hellenic National Meteorological Service
Division of Climatology-Applications
El. Venizelou Street 14, 16777
Helliniko, Athens

Web addresses of HNMS
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www.meteo.gov.gr
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3rd 10-day period (21-31/08/2012)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	36.0	38.0	39.8	40.0	39.4	38.0	35.8	34.2	34.0	35.4	35.6	36.9	35.7	32.2
	Min	17.0	17.4	18.4	18.6	19.0	18.6	19.4	20.4	14.8	15.6	16.0	17.7	18.4	16.7
Relative Humidity	Max	71	69	66	56	65	66	77	42	66	56	63	63	82	-
	Min	24	23	18	20	22	31	26	20	20	21	20	22	27	-
Soil Temperature at 10 cm	06 UTC	30.0	30.2	30.6	30.8	30.8	30.4	30.2	30.4	29.2	28.8	28.8	30.0	30.6	25.7
	12 UTC	34.4	34.8	35.4	35.4	35.4	35.2	34.6	34.8	35.0	32.4	33.4	34.6	35.3	31.3
Sunshine Duration		12.8	12.6	12.4	12.0	11.6	11.9	12.2	12.2	12.3	12.0	12.3	12.2	11.8	10.2
Precipitation															9.6
Evaporation		8.6	8.1	8.6	8.1	9.1	9.0	10.0	7.8	7.4	7.5	8.6	92.8	100.9	73.7
Growing Degrees	5	21.5	22.7	24.1	24.3	24.2	23.3	22.6	22.3	19.4	20.5	20.8	245.7	242.4	214.1
	10	16.5	17.7	19.1	19.3	19.2	18.3	17.6	17.3	14.4	15.5	15.8	190.7	187.4	159.1

3rd 10-day period (21-31/08/2012)	Previous Year Value	Past Years Mean Value	
Reference Evapotranspiration	58.8	57.6	50.3
Precipitation - Reference Evapotranspiration	-58.8	-57.6	-40.7
Number of Rainy Days	0.0	0.0	1.2
Number of Dry Days	29.0	75.0	-

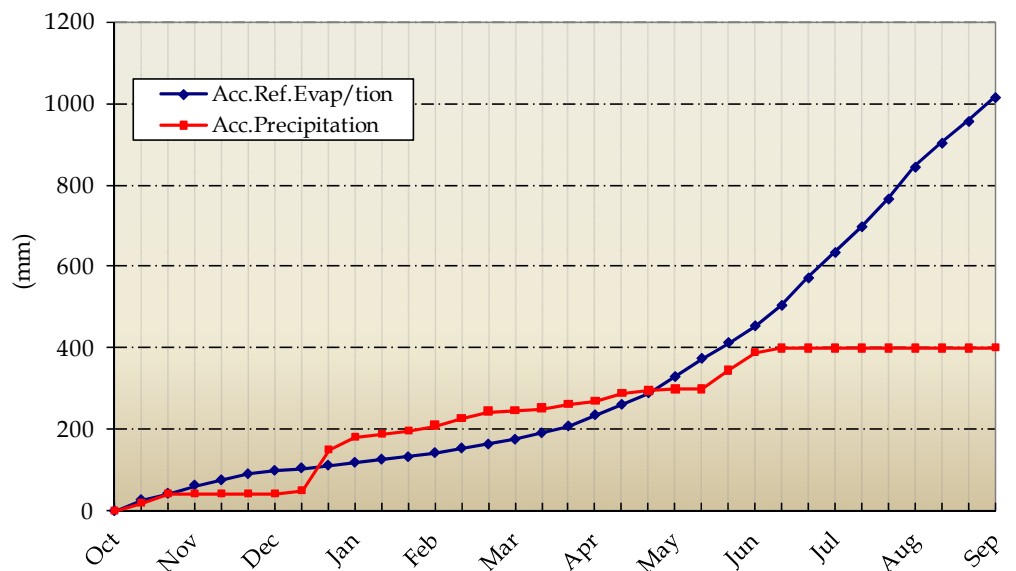
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



3rd 10-day period (21-31/08/2012)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	35.4	37.2	35.4	38.4	38.6	31.8	32.4	30.4	29.6	31.2	30.8	33.7	31.9	29.1
	Min	20.8	21.6	21.2	22.4	22.6	20.4	20.0	16.2	17.0	14.0	18.6	19.5	19.4	16.6
Relative Humidity	Max	75	73	77	79	70	81	87	79	74	78	75	77	74	-
	Min	23	21	29	17	15	35	36	26	32	23	25	26	33	-
Soil Temperature at 10 cm	06 UTC	28.2	28.8	29.4	29.4	29.4	29.4	29.4	27.0	25.2	25.4	25.8	27.9	26.5	23.0
	12 UTC	31.4	32.2	32.4	32.4	32.4	32.6	32.4	28.6	28.2	28.4	33.8	31.3	29.4	27.1
Sunshine Duration		12.5	12.3	13.2	13.0	12.4	12.4	9.0	10.9	12.6	12.4	12.3	12.1	12.1	9.8
Precipitation									1.4				1.4		4.5
Evaporation		7.3	12.6	7.9	7.5	12.0	10.5	5.8	8.7	7.3	7.5	9.0	96.1	106.1	93.1
Growing Degrees	5	23.1	24.4	23.3	25.4	25.6	21.1	21.2	18.3	18.3	17.6	19.7	238.0	227.4	196.4
	10	18.1	19.4	18.3	20.4	20.6	16.1	16.2	13.3	13.3	12.6	14.7	183.0	172.4	141.4

3rd 10-day period (21-31/08/2012)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	58.7	63.7	54.2
Precipitation - Reference Evapotranspiration	-57.3	-63.7	-49.7
Number of Rainy Days	1.0	0.0	1.0
Number of Dry Days	82.0	20.0	-

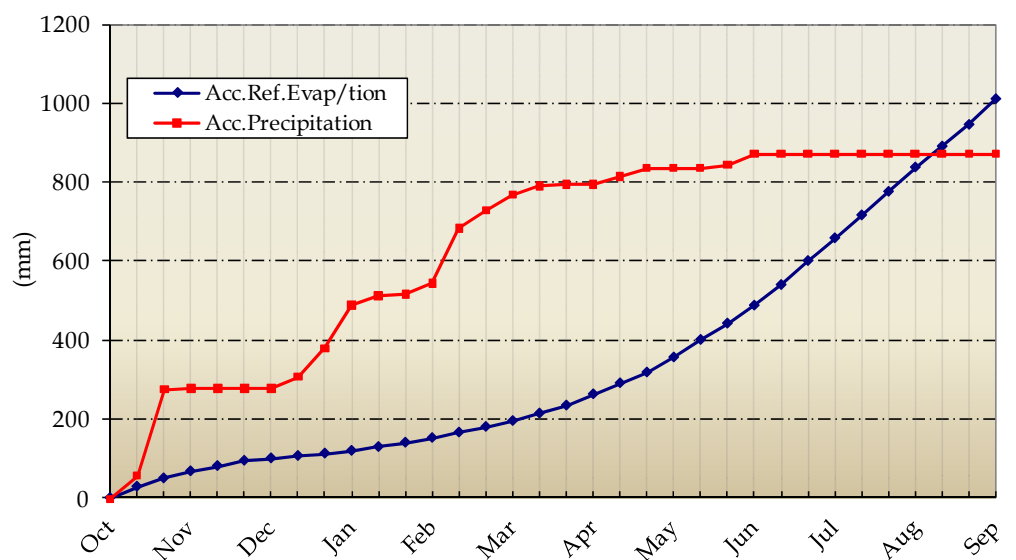
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



3rd 10-day period (21-31/08/2012)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	34.1	33.6	35.5	34.7	34.9	34.0	31.8	34.0	31.6	32.6	34.9	33.8	34.4	30.0
	Min	20.2	18.0	17.7	19.5	20.5	20.1	20.2	24.4	19.3	17.6	16.6	19.5	19.5	18.5
Relative Humidity	Max	77	82	81	72	79	81	80	83	84	83	80	80	84	-
	Min	23	26	23	29	26	32	47	15	21	17	17	25	27	-
Soil Temperature at 10 cm	06 UTC	28.4	28.2	28.4	29.0	29.4	29.0	28.8	29.4	28.2	27.4	27.2	28.5	27.7	26.8
	12 UTC	36.0	36.4	37.0	37.2	37.0	37.0	36.2	36.0	36.0	35.4	36.0	36.4	35.1	30.8
Sunshine Duration		11.8	11.9	11.7	12.2	11.5	11.3	11.6	11.3	11.3	11.1	11.9	11.6	11.0	10.6
Precipitation															3.8
Evaporation		10.0	8.2	9.6	6.6	8.0	8.5	8.3	10.1	7.7	7.7	8.3	93.0	-	74.7
Growing Degrees	5	22.2	20.8	21.6	22.1	22.7	22.1	21.0	24.2	20.5	20.1	20.8	237.9	241.2	211.8
	10	17.2	15.8	16.6	17.1	17.7	17.1	16.0	19.2	15.5	15.1	15.8	182.9	186.2	156.8

3rd 10-day period (21-31/08/2012)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	65.2	65.0	49.7
Precipitation - Reference Evapotranspiration	-65.2	-65.0	-45.9
Number of Rainy Days	0.0	0.0	0.7
Number of Dry Days	94.0	77.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

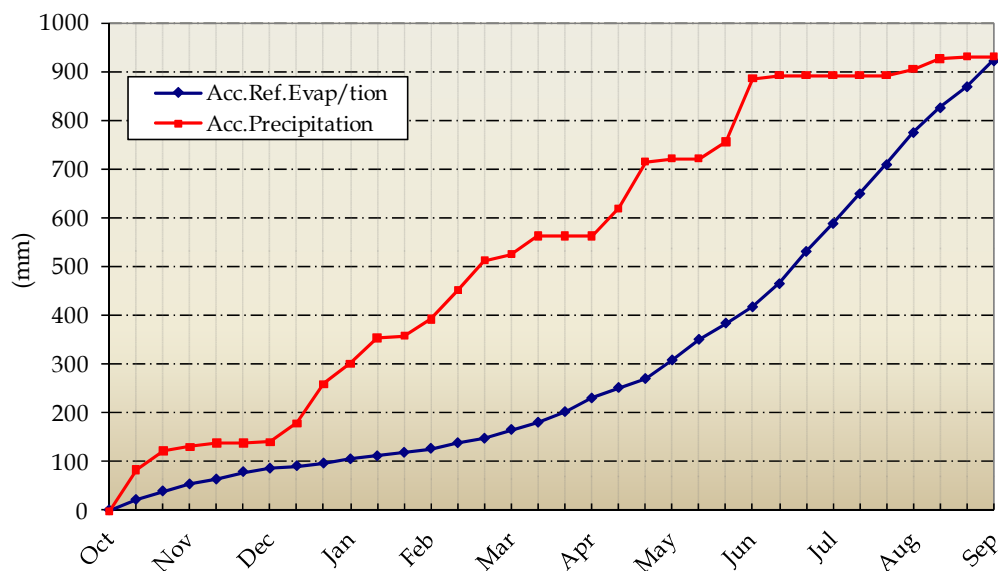


Ioannina

3rd 10-day period (21-31/08/2012)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	33.6	37.0	37.2	37.8	36.8	36.0	32.4	33.2	32.4	33.6	33.0	34.8	-	29.2
	Min	15.4	20.6	15.0	16.4	17.0	15.2	13.4	20.0	10.2	13.0	13.5	15.4	-	14.3
Relative Humidity	Max	71	72	66	87	69	63	67	55	58	70	77	69	-	-
	Min	21	19	23	19	19	20	21	18	16	19	21	20	-	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-	21.9
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-	25.5
Sunshine Duration		10.9	11.0	9.6	9.2	9.8	8.9	9.9	8.8	9.8	9.4	9.4	9.7	-	8.9
Precipitation														-	15.9
Evaporation		-	-	-	-	-	-	-	-	-	-	-	-	-	70.8
Growing Degrees	5	19.5	23.8	21.1	22.1	21.9	20.6	17.9	21.6	16.3	18.3	18.3	221.4	-	178.0
	10	14.5	18.8	16.1	17.1	16.9	15.6	12.9	16.6	11.3	13.3	13.3	166.4	-	124.8

3rd 10-day period (21-31/08/2012)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	53.1	-	44.4
Precipitation - Reference Evapotranspiration	-53.1	-	-28.5
Number of Rainy Days	0.0	-	2.1
Number of Dry Days	14.0	-	-

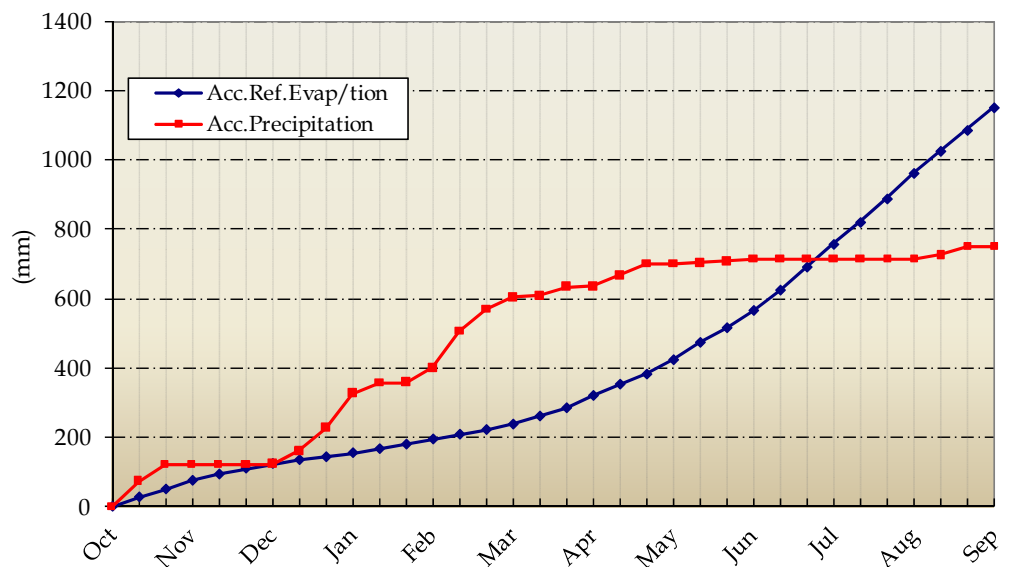
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



3rd 10-day period (21-31/08/2012)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	32.5	32.3	38.0	36.7	36.4	34.9	37.8	31.2	30.5	30.4	30.5	33.7	32.1	30.5
	Min	20.9	17.2	19.2	20.2	18.4	22.9	21.1	20.5	18.2	15.4	15.2	19.0	19.3	17.7
Relative Humidity	Max	81	87	72	82	85	86	89	81	83	85	86	83	91	-
	Min	23	32	18	22	18	26	18	49	35	35	41	29	35	-
Soil Temperature at 10 cm	06 UTC	25.8	25.0	26.0	26.0	26.0	26.4	26.6	26.6	26.0	25.4	25.0	25.9	26.1	25.4
	12 UTC	28.0	27.4	27.8	27.8	26.0	28.0	28.0	28.2	27.6	27.4	27.2	27.6	28.9	29.0
Sunshine Duration		12.2	12.0	12.0	12.5	11.8	11.9	12.0	8.8	11.9	11.8	12.0	11.7	10.6	10.0
Precipitation														1.3	3.6
Evaporation		12.0	8.7	11.1	9.9	5.7	4.4	8.5	13.2	11.0	4.2	6.4	95.1	94.7	81.7
Growing Degrees	5	21.7	19.8	23.6	23.5	22.4	23.9	24.5	20.9	19.4	17.9	17.9	235.2	227.9	210.0
	10	16.7	14.8	18.6	18.5	17.4	18.9	19.5	15.9	14.4	12.9	12.9	180.2	172.9	155.0

3rd 10-day period (21-31/08/2012)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	65.4	60.2	52.5
Precipitation - Reference Evapotranspiration	-65.4	-58.9	-48.9
Number of Rainy Days	0.0	1.0	0.9
Number of Dry Days	19.0	73.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

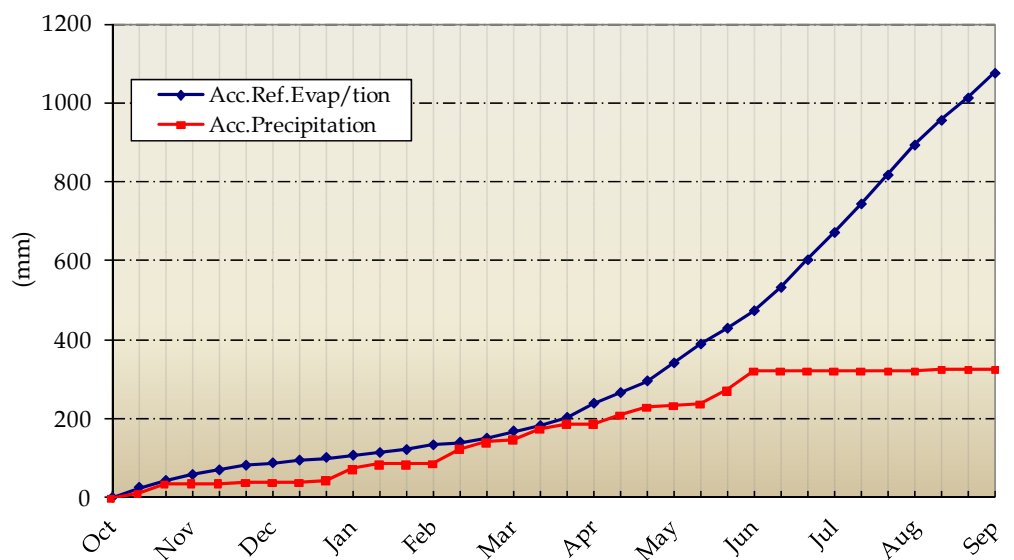


Larisa

3rd 10-day period (21-31/08/2012)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	33.8	37.5	39.8	37.8	39.4	38.9	38.8	32.2	32.7	32.0	32.0	35.9	32.5	31.3
	Min	17.2	18.0	17.8	19.2	19.4	19.2	17.9	19.6	14.0	15.7	15.5	17.6	18.5	16.4
Relative Humidity	Max	67	60	62	57	59	59	59	59	66	70	68	62	80	-
	Min	21	15	13	18	17	14	12	17	21	24	20	17	36	-
Soil Temperature at 10 cm	06 UTC	27.8	28.0	28.2	28.4	28.8	28.6	28.4	28.4	27.2	27.4	27.2	28.0	27.3	25.5
	12 UTC	29.8	29.8	30.0	30.4	31.6	30.2	30.4	29.8	29.2	28.6	29.0	29.9	30.3	27.7
Sunshine Duration		12.2	11.8	11.7	11.6	11.1	10.1	10.7	11.3	10.9	10.4	10.7	11.1	11.2	9.7
Precipitation														24.2	8.3
Evaporation		9.4	9.8	11.9	10.7	7.4	12.2	11.5	8.1	6.2	10.6	8.6	106.4	108.0	85.2
Growing Degrees	5	20.5	22.8	23.8	23.5	24.4	24.1	23.4	20.9	18.4	18.9	18.8	239.2	225.5	207.5
	10	15.5	17.8	18.8	18.5	19.4	19.1	18.4	15.9	13.4	13.9	13.8	184.2	170.5	152.5

3rd 10-day period (21-31/08/2012)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	62.8	61.5	54.4
Precipitation - Reference Evapotranspiration	-62.8	-37.3	-46.1
Number of Rainy Days	0.0	1.0	1.6
Number of Dry Days	20.0	20.0	-

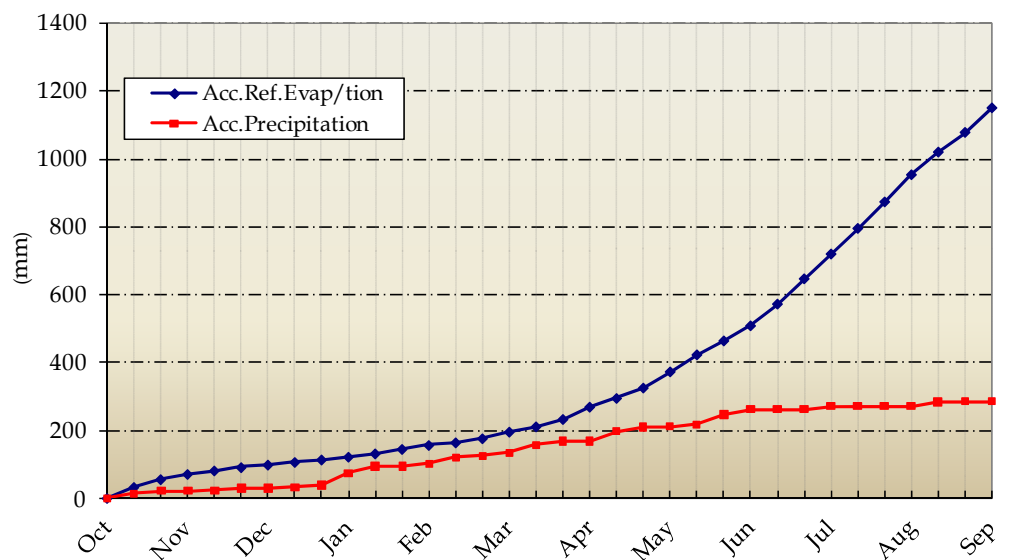
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



3rd 10-day period (21-31/08/2012)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	33.6	36.6	37.2	36.0	37.0	37.0	32.5	30.4	30.8	30.2	30.6	33.8	-	29.9
	Min	19.0	20.4	21.2	20.0	21.5	22.8	22.0	22.8	16.6	17.7	18.2	20.2	-	17.9
Relative Humidity	Max	65	64	63	65	65	68	53	55	69	75	75	65	-	-
	Min	27	18	16	20	18	15	28	25	25	34	33	24	-	-
Soil Temperature at 10 cm	06 UTC	28.8	29.2	29.6	29.4	30.0	30.2	30.0	27.4	27.6	27.6	28.0	28.9	-	25.1
	12 UTC	33.2	33.4	33.8	33.6	34.0	34.0	34.0	33.8	34.8	31.4	31.6	33.4	-	29.4
Sunshine Duration		11.9	11.9	11.7	10.0	10.5	11.1	11.3	11.7	10.5	11.5	10.9	11.2	-	9.2
Precipitation														-	10.5
Evaporation		6.0	9.4	7.8	8.2	12.2	10.4	16.8	16.0	9.0	11.0	7.4	114.2	-	84.9
Growing Degrees	5	21.3	23.5	24.2	23.0	24.3	24.9	22.3	21.6	18.7	19.0	19.4	242.1	-	208.0
	10	16.3	18.5	19.2	18.0	19.3	19.9	17.3	16.6	13.7	14.0	14.4	187.1	-	153.0

3rd 10-day period (21-31/08/2012)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	72.4	-	53.4
Precipitation - Reference Evapotranspiration	-72.4	-	-42.9
Number of Rainy Days	0.0	-	1.6
Number of Dry Days	20.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

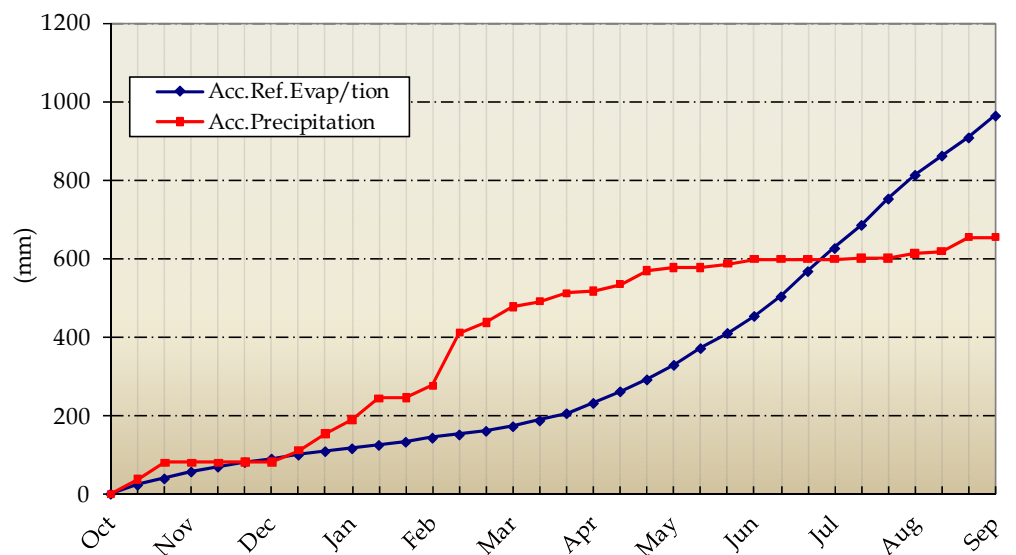


Tripoli

3rd 10-day period (21-31/08/2012)		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	34.5	35.7	36.5	36.5	36.4	36.2	29.2	31.1	32.0	31.3	33.6	30.1	29.3
	Min	19.6	18.0	15.8	14.4	14.4	14.2	14.3	16.9	11.7	11.0	11.7	14.7	16.9	13.3
Relative Humidity	Max	36	37	25	45	43	45	64	60	83	67	44	50	59	-
	Min	23	16	14	15	12	12	9	22	13	13	11	15	31	-
Soil Temperature at 10 cm	06 UTC	24.0	24.2	24.6	24.8	25.2	25.2	25.2	25.6	23.8	23.2	23.4	24.5	25.3	23.4
	12 UTC	29.8	31.0	31.2	31.2	31.4	31.4	30.6	29.8	29.6	28.8	28.8	30.3	30.5	26.2
Sunshine Duration		12.0	11.8	11.8	11.5	11.4	9.7	11.6	11.5	11.4	11.5	11.5	11.4	10.9	9.5
Precipitation														1.9	5.3
Evaporation		8.4	8.6	8.8	8.2	8.7	5.3	3.5	3.5	7.9	6.3	10.2	79.4	85.2	54.7
Growing Degrees	5	20.0	21.3	20.8	20.5	20.5	20.3	20.3	18.1	16.4	16.5	16.5	210.9	203.2	179.5
	10	15.0	16.3	15.8	15.5	15.5	15.3	15.3	13.1	11.4	11.5	11.5	155.9	148.2	124.5

3rd 10-day period (21-31/08/2012)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	55.8	57.9	47.4
Precipitation - Reference Evapotranspiration	-55.8	-56.0	-42.1
Number of Rainy Days	0.0	1.0	1.2
Number of Dry Days	16.0	15.0	-

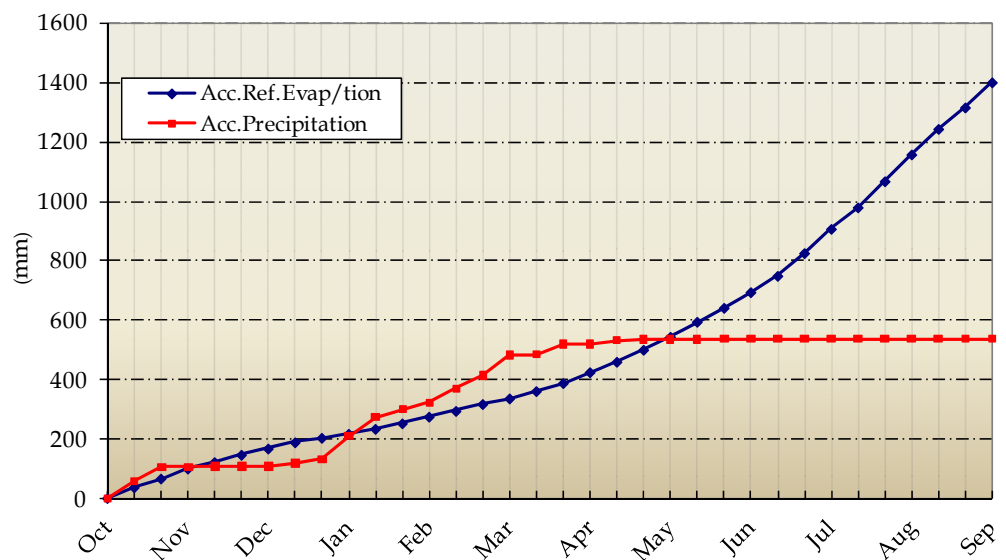
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



3rd 10-day period (21-31/08/2012)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	33.4	30.0	36.0	38.6	37.6	33.8	30.8	32.0	30.8	32.4	31.8	33.4	32.2	30.8
	Min	19.6	19.2	21.8	22.2	22.2	20.4	20.6	23.4	22.6	18.6	17.2	20.7	19.2	19.9
Relative Humidity	Max	75	77	46	41	47	74	87	43	53	51	52	59	75	-
	Min	24	22	14	5	7	14	27	19	17	18	14	16	30	-
Soil Temperature at 10 cm	06 UTC	29.0	29.2	30.0	30.4	30.8	30.4	30.0	30.8	29.6	28.0	27.6	29.6	28.2	29.7
	12 UTC	34.6	35.0	35.8	35.6	36.0	36.0	35.4	34.4	33.2	32.0	32.0	34.5	32.6	33.5
Sunshine Duration		12.1	12.3	12.3	12.4	12.6	12.5	11.7	11.7	12.5	12.5	11.9	12.2	12.2	11.2
Precipitation															
Evaporation		10.8	12.4	14.0	12.2	14.5	10.0	9.8	15.7	15.7	12.8	12.4	140.3	128.8	108.9
Growing Degrees	5	21.5	19.6	23.9	25.4	24.9	22.1	20.7	22.7	21.7	20.5	19.5	242.5	227.8	224.3
	10	16.5	14.6	18.9	20.4	19.9	17.1	15.7	17.7	16.7	15.5	14.5	187.5	172.8	169.3

3rd 10-day period (21-31/08/2012)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	84.5	75.2	61.2
Precipitation - Reference Evapotranspiration	-84.5	-75.2	-61.2
Number of Rainy Days	0.0	0.0	0.0
Number of Dry Days	106.0	95.0	-

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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Issue Editors :

Charalabopoulos Christos

Filiou Anna

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