



AGROMETEOROLOGICAL BULLETIN

September 2019
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



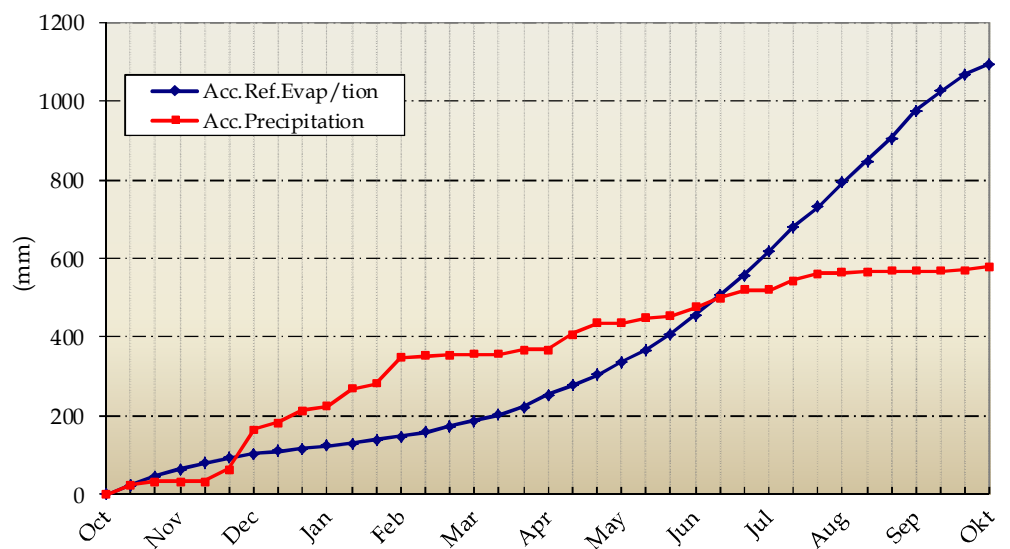
Hellenic National Meteorological Service
Division of Climatology-Applications
El. Venizelou Street 14, 16777
Helliniko, Athens

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

3rd 10-day period (21-30/09/2019)		21	22	23	24	25	26	27	28	29	30	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	23.6	23.8	23.6	21.8	25.4	25.0	26.2	27.2	26.0	28.4	25.1	23.8	24.9
	Min	9.0	9.0	8.6	15.0	15.4	14.2	17.4	13.4	11.8	13.4	12.7	14.0	13.0
Relative Humidity	Max	85	65	90	98	96	93	94	93	91	87	89	74	-
	Min	25	30	45	67	56	64	45	35	38	39	44	40	-
Soil Temperature at 10 cm	06 UTC	18.4	19.2	18.8	21.0	20.2	19.4	21.0	20.2	19.8	20.4	19.8	20.5	19.0
	12 UTC	24.4	25.2	25.0	23.6	24.0	25.0	25.6	26.0	25.6	26.0	25.0	23.0	22.4
Sunshine Duration		11.1	10.5	10.4	1.2	3.8	9.6	9.9	10.1	9.3	10.4	8.6	6.0	7.5
Precipitation					7.8							7.8	13.1	12.3
Evaporation		5.1	3.9	3.0	3.9	2.9	3.0	5.8	7.0	2.4	5.7	42.7	46.2	59.3
Growing Degrees	5	11.3	11.4	11.1	13.4	15.4	14.6	16.8	15.3	13.9	15.9	139.1	139.1	139.4
	10	6.3	6.4	6.1	8.4	10.4	9.6	11.8	10.3	8.9	10.9	89.1	89.1	89.4

3rd 10-day period (21-30/09/2019)	Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	27.9	33.6
Precipitation - Reference Evapotranspiration	-20.1	-20.5
Number of Rainy Days	1.0	2.0
Number of Dry Days	3.0	12.0

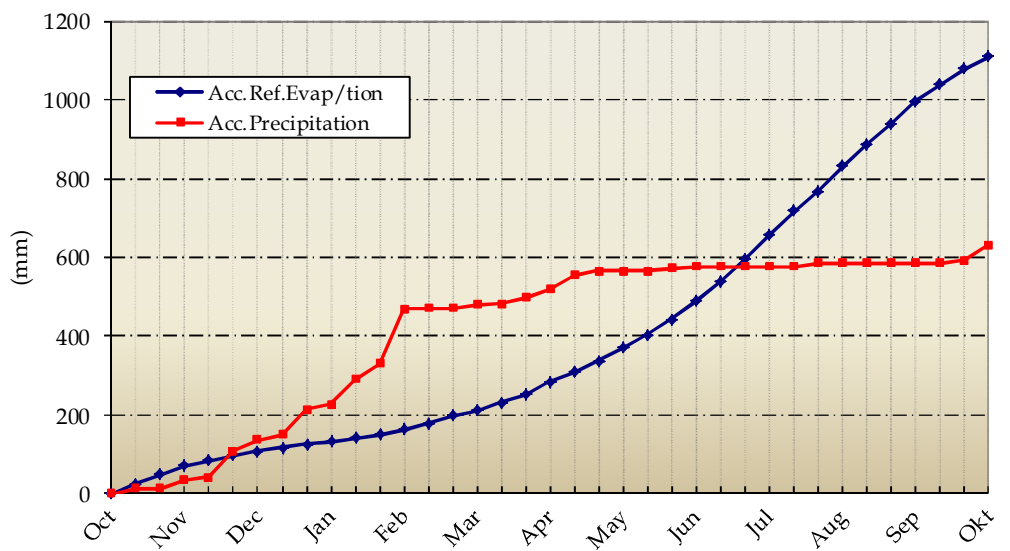
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



3rd 10-day period (21-30/09/2019)		21	22	23	24	25	26	27	28	29	30	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	28.2	27.6	28.0	26.9	26.6	28.3	27.8	28.6	28.6	28.5	27.9	26.5	27.0
	Min	17.0	12.9	16.4	17.8	20.3	17.6	18.3	17.1	18.0	17.4	17.3	16.2	15.6
Relative Humidity	Max	100	82	89	100	100	100	100	100	100	100	97	87	-
	Min	34	27	45	65	53	46	49	45	35	47	45	39	-
Soil Temperature at 10 cm	06 UTC	24.8	23.2	23.6	25.2	25.0	23.6	24.2	23.2	24.0	24.2	24.1	24.2	22.0
	12 UTC	27.2	28.8	28.4	23.6	23.6	25.2	25.8	28.6	26.6	26.0	26.4	25.9	25.5
Sunshine Duration		9.0	10.2	9.8	3.8	9.7	9.0	9.5	10.4	10.1	9.9	9.1	7.0	8.1
Precipitation					39.6							39.6	17.7	16.0
Evaporation		5.0	6.0	4.4	0.0	1.0	3.4	3.6	5.0	4.3	5.0	37.7	73.0	48.4
Growing Degrees	5	17.6	15.3	17.2	17.4	18.5	18.0	18.1	17.9	18.3	18.0	176.0	163.7	162.7
	10	12.6	10.3	12.2	12.4	13.5	13.0	13.1	12.9	13.3	13.0	126.0	113.7	112.7

3rd 10-day period (21-30/09/2019)	Previous Year Value	Past Years Mean Value	
Reference Evapotranspiration	31.9	34.7	30.8
Precipitation - Reference Evapotranspiration	7.7	-17.0	-14.8
Number of Rainy Days	1.0	2.0	1.5
Number of Dry Days	3.0	32.0	-

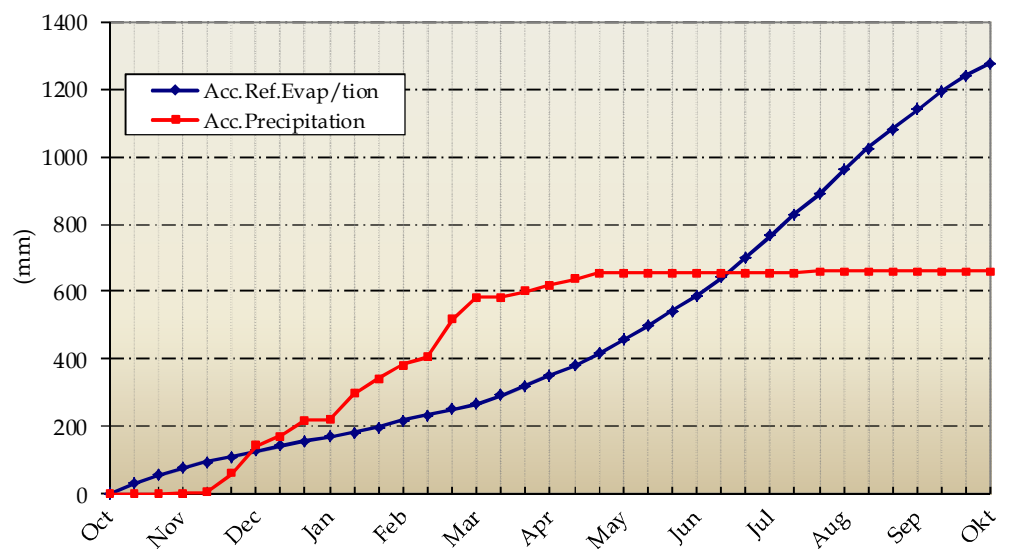
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



3rd 10-day period (21-30/09/2019)		21	22	23	24	25	26	27	28	29	30	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	24.2	23.2	25.6	27.4	26.6	27.0	27.0	25.8	25.8	26.4	25.9	26.1	25.7
	Min	21.6	20.4	16.6	17.8	22.6	18.4	19.4	19.4	17.6	17.2	19.1	19.7	18.8
Relative Humidity	Max	85	66	79	83	90	90	92	94	89	89	86	88	-
	Min	46	49	56	43	61	60	66	67	57	55	56	64	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
Sunshine Duration		7.7	10.6	10.4	9.5	10.5	10.4	10.1	10.1	10.2	10.3	10.0	8.2	8.3
Precipitation													4.1	4.1
Evaporation		10.5	4.7	2.0	2.3	4.0	4.8	1.5	4.1	4.6	2.8	41.3	42.1	61.7
Growing Degrees	5	17.9	16.8	16.1	17.6	19.6	17.7	18.2	17.6	16.7	16.8	175.0	179.2	172.5
	10	12.9	11.8	11.1	12.6	14.6	12.7	13.2	12.6	11.7	11.8	125.0	129.2	122.5

3rd 10-day period (21-30/09/2019)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	37.4	35.3	-
Precipitation - Reference Evapotranspiration	-37.4	-31.2	4.1
Number of Rainy Days	0.0	2.0	0.6
Number of Dry Days	75.0	13.0	-

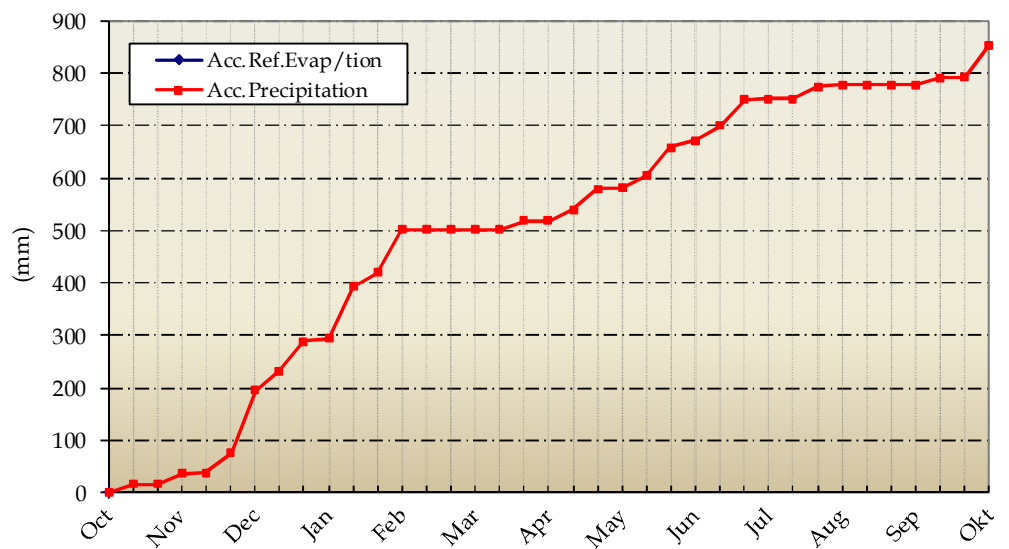
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



3rd 10-day period (21-30/09/2019)		21	22	23	24	25	26	27	28	29	30	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	26.8	25.6	27.8	25.0	26.3	25.0	27.8	27.4	29.2	27.4	26.8	24.0	24.8
	Min	10.0	9.2	13.0	15.6	9.6	11.8	12.0	9.8	12.0	9.8	11.3	12.1	11.3
Relative Humidity	Max	96	100	85	100	95	100	100	88	95	100	96	93	-
	Min	30	39	41	46	42	48	32	40	32	40	39	37	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	16.9
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	19.5
Sunshine Duration		9.0	8.7	6.4	6.3	7.9	2.6	6.8	8.8	8.6	7.9	7.3	5.8	6.4
Precipitation					60.9							60.9	6.9	24.5
Evaporation		-	-	-	-	-	-	-	-	-	-	-	-	40.6
Growing Degrees	5	13.4	12.4	15.4	15.3	13.0	13.4	14.9	13.6	15.6	13.6	140.6	130.8	130.3
	10	8.4	7.4	10.4	10.3	8.0	8.4	9.9	8.6	10.6	8.6	90.6	80.8	80.3

3rd 10-day period (21-30/09/2019)	Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	-	25.1
Precipitation - Reference Evapotranspiration	-	-0.6
Number of Rainy Days	1.0	2.5
Number of Dry Days	3.0	19.0

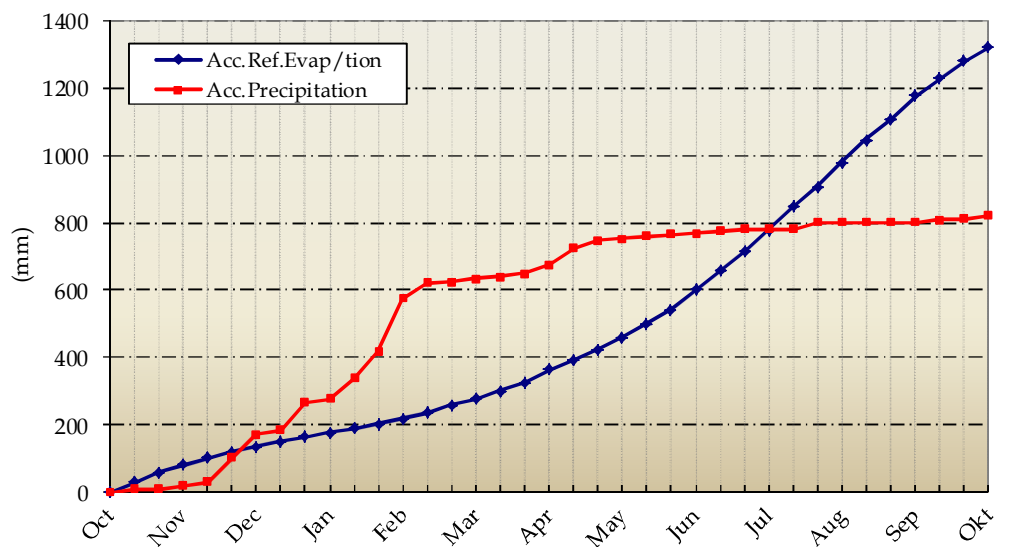
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



3rd 10-day period (21-30/09/2019)		21	22	23	24	25	26	27	28	29	30	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	27.8	27.9	28.9	26.0	29.2	30.3	29.0	29.2	28.6	31.3	28.8	27.1	27.6
	Min	19.1	16.4	15.0	17.8	17.8	16.4	18.6	16.9	17.3	17.8	17.3	16.7	15.0
Relative Humidity	Max	74	81	81	92	87	88	88	90	91	90	86	81	-
	Min	38	26	30	63	36	35	46	43	47	31	40	40	-
Soil Temperature at 10 cm	06 UTC	25.2	24.4	24.0	24.6	22.4	22.4	23.0	23.5	23.8	24.2	23.8	23.4	21.4
	12 UTC	27.2	24.8	24.8	19.8	25.0	26.4	26.0	23.8	26.4	26.5	25.1	25.4	24.4
Sunshine Duration		5.2	9.6	10.4	3.7	10.6	10.7	10.8	10.1	10.9	10.3	9.2	7.0	7.7
Precipitation			0.1		11.3							11.4	61.0	12.3
Evaporation		4.3	7.7	5.5	0.1	5.3	5.1	5.2	2.7	6.9	3.9	46.7	58.2	51.4
Growing Degrees	5	18.5	17.2	17.0	16.9	18.5	18.4	18.8	18.1	18.0	19.6	180.7	168.9	162.8
	10	13.5	12.2	12.0	11.9	13.5	13.4	13.8	13.1	13.0	14.6	130.7	118.9	112.8

3rd 10-day period (21-30/09/2019)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	40.8	41.3	32.9
Precipitation - Reference Evapotranspiration	-29.4	19.7	-20.6
Number of Rainy Days	2.0	4.0	1.7
Number of Dry Days	1.0	29.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

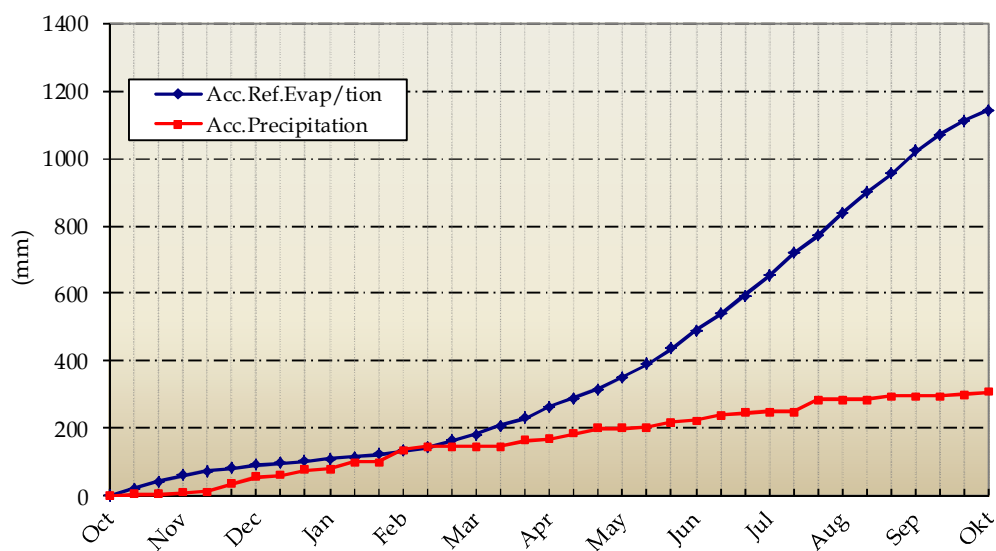


Larisa

3rd 10-day period (21-30/09/2019)		21	22	23	24	25	26	27	28	29	30	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	22.0	25.6	28.8	24.8	26.9	31.2	29.0	29.2	30.2	33.4	28.1	24.5	27.3
	Min	15.8	9.0	11.4	16.0	14.4	13.1	16.4	11.8	13.4	13.4	13.5	13.1	13.0
Relative Humidity	Max	86	95	95	97	98	98	85	92	95	97	94	74	-
	Min	47	33	35	64	43	33	32	32	35	24	38	34	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	20.9
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	22.7
Sunshine Duration		2.4	7.8	6.7	3.2	7.8	7.1	7.6	8.5	7.4	7.3	6.6	3.5	7.0
Precipitation					7.0							7.0	12.2	7.0
Evaporation		3.9	5.0	4.1	2.7	6.1	3.9	8.4	6.9	6.1	5.8	52.9	41.6	51.2
Growing Degrees	5	13.9	12.3	15.1	15.4	15.7	17.2	17.7	15.5	16.8	18.4	157.9	138.3	151.5
	10	8.9	7.3	10.1	10.4	10.7	12.2	12.7	10.5	11.8	13.4	107.9	88.3	101.5

3rd 10-day period (21-30/09/2019)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	30.6	29.0	31.7
Precipitation - Reference Evapotranspiration	-23.6	-16.8	-24.7
Number of Rainy Days	1.0	2.0	1.7
Number of Dry Days	3.0	15.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

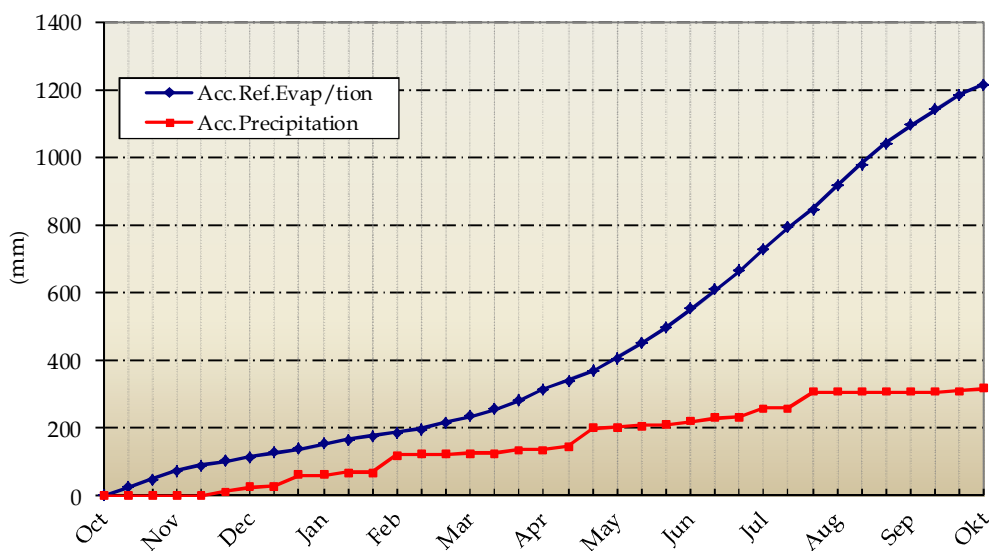


Mikra

3rd 10-day period (21-30/09/2019)		21	22	23	24	25	26	27	28	29	30	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	23.0	24.5	26.0	24.3	25.0	26.6	27.2	27.1	28.2	28.4	26.0	24.9	25.8
	Min	14.6	12.4	14.4	16.4	15.6	16.5	18.4	14.6	15.4	16.0	15.4	14.3	14.1
Relative Humidity	Max	78	84	85	94	95	93	80	90	92	91	88	64	-
	Min	38	41	48	65	65	60	37	50	40	51	50	26	-
Soil Temperature at 10 cm	06 UTC	22.2	21.0	22.4	23.0	21.4	21.4	21.8	21.0	22.0	21.8	21.8	21.6	19.9
	12 UTC	24.8	24.6	25.0	24.0	24.0	24.0	23.4	24.0	24.8	25.0	24.4	24.7	23.6
Sunshine Duration		8.6	9.8	7.6	1.0	4.9	7.8	10.3	11.9	9.5	10.3	8.2	5.9	6.9
Precipitation				0.0	8.2							8.2	7.6	10.7
Evaporation		-	-	-	-	-	-	-	-	-	-	-	57.1	49.1
Growing Degrees	5	13.8	13.5	15.2	15.4	15.3	16.6	17.8	15.9	16.8	17.2	157.3	145.9	149.6
	10	8.8	8.5	10.2	10.4	10.3	11.6	12.8	10.9	11.8	12.2	107.3	95.9	99.6

3rd 10-day period (21-30/09/2019)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	31.0	39.7	29.8
Precipitation - Reference Evapotranspiration	-22.8	-32.1	-19.1
Number of Rainy Days	1.0	2.0	1.5
Number of Dry Days	3.0	14.0	-

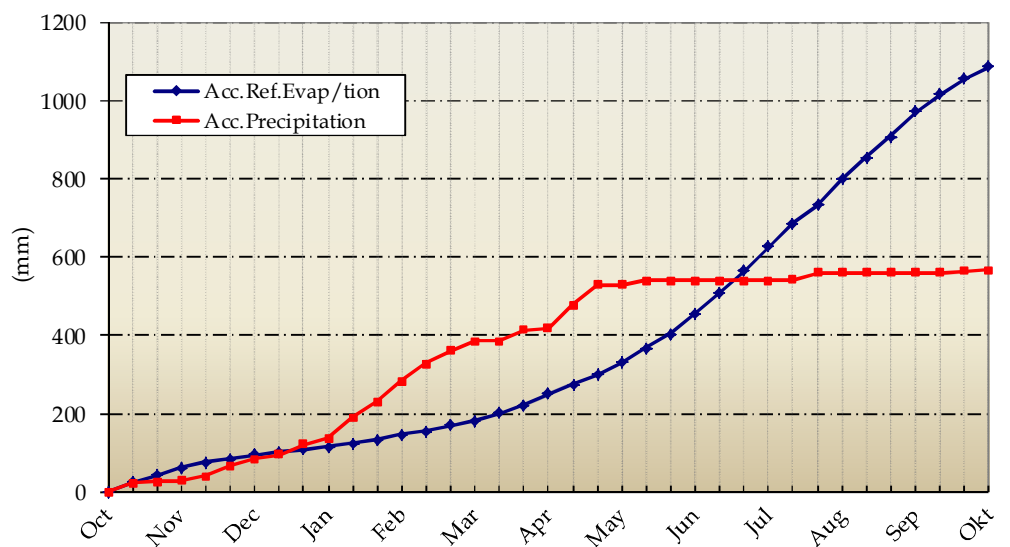
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



3rd 10-day period (21-30/09/2019)		21	22	23	24	25	26	27	28	29	30	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	22.1	23.5	27.1	24.8	26.4	30.2	28.2	28.3	29.4	30.8	27.1	22.6	26.5
	Min	17.4	11.3	11.3	17.6	15.4	14.7	18.0	15.3	14.6	14.7	15.0	15.2	13.9
Relative Humidity	Max	71	74	77	96	96	98	94	71	73	92	84	80	-
	Min	29	32	31	60	40	28	33	30	27	31	34	46	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
Sunshine Duration		8.7	12.0	9.5	0.5	9.4	9.4	10.8	10.5	10.3	10.1	9.1	4.8	
Precipitation					1.9							1.9	156.4	7.7
Evaporation		-	-	-	-	-	-	-	-	-	-	-	-	-
Growing Degrees	5	14.8	12.4	14.2	16.2	15.9	17.5	18.1	16.8	17.0	17.8	160.6	139.1	
	10	9.8	7.4	9.2	11.2	10.9	12.5	13.1	11.8	12.0	12.8	110.6	89.1	

3rd 10-day period (21-30/09/2019)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	31.4	28.0	
Precipitation - Reference Evapotranspiration	-29.5	128.4	7.7
Number of Rainy Days	1.0	4.0	1.7
Number of Dry Days	10.0	13.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

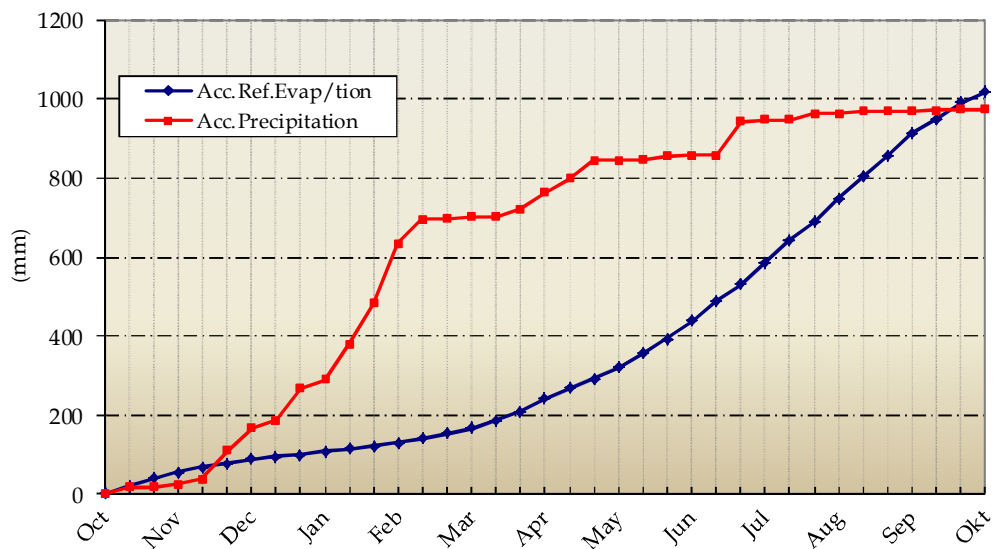


Tripoli

3rd 10-day period (21-30/09/2019)		21	22	23	24	25	26	27	28	29	30	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	19.7	25.3	28.5	22.9	25.1	28.8	27.6	26.9	28.4	30.2	26.3	21.2	25.0
	Min	14.5	6.7	8.2	12.6	10.6	8.5	10.2	11.1	10.7	10.3	10.3	10.4	10.2
Relative Humidity	Max	91	97	94	95	97	100	94	100	97	98	96	95	-
	Min	53	26	19	59	39	26	29	34	30	19	33	49	-
Soil Temperature at 10 cm	06 UTC	-	-	18.8	20.8	18.0	18.6	-	-	-	20.4	19.3	18.1	18.9
	12 UTC	-	-	25.8	21.6	24.2	25.2	-	-	-	26.8	24.7	20.7	21.1
Sunshine Duration		3.5	9.9	10.1	2.0	9.2	9.9	5.9	8.2	9.5	9.6	7.8	5.0	7.8
Precipitation		0.0			1.6	0.5			0.0	0.0	0.0	2.1	58.5	11.6
Evaporation		-	-	8.8	0.7	3.2	-	-	-	-	4.4	-	30.0	36.1
Growing Degrees	5	12.1	11.0	13.4	12.8	12.9	13.7	13.9	14.0	14.6	15.3	133.4	107.6	126.3
	10	7.1	6.0	8.4	7.8	7.9	8.7	8.9	9.0	9.6	10.3	83.4	57.6	76.4

3rd 10-day period (21-30/09/2019)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	28.0	24.8	29.5
Precipitation - Reference Evapotranspiration	-25.9	33.7	-17.9
Number of Rainy Days	2.0	6.0	1.5
Number of Dry Days	3.0	10.0	-

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 :

Papakrivou Anastasia

The present bulletin was designed and implemented under the support of Water Resources Management Division of Agriculture University of Athens