



# AGROMETEOROLOGICAL BULLETIN

*August 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



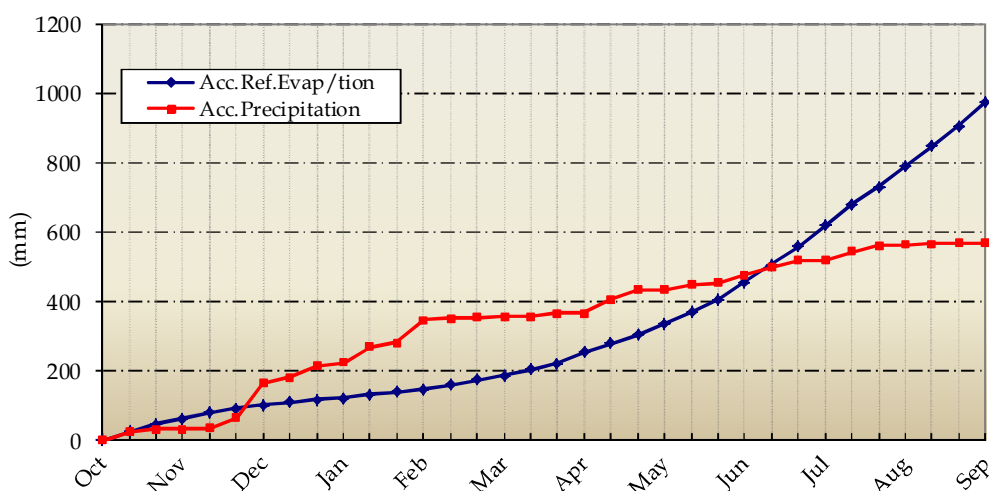
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3rd 10-day period (21-31/08/2019)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	31.8	37.0	36.6	37.0	37.4	36.6	35.4	33.6	33.4	32.8	31.6	34.8	33.3	29.1
	Min	16.0	19.4	24.6	20.6	24.8	25.4	24.2	24.0	19.0	17.2	20.2	21.4	20.3	16.6
Relative Humidity	Max	84	83	49	77	51	51	59	47	63	66	63	63	70	-
	Min	36	26	23	27	23	24	27	21	20	29	29	26	28	-
Soil Temperature at 10 cm	06 UTC	26.0	27.2	28.6	28.8	29.2	29.0	28.4	28.4	27.0	27.2	26.6	27.9	27.2	23.0
	12 UTC	31.0	32.2	33.4	34.0	33.6	34.2	33.2	33.2	32.4	32.4	31.4	32.8	31.1	27.1
Sunshine Duration		10.7	11.9	11.5	12.2	12.5	12.6	11.9	12.4	12.4	11.3	12.5	12.0	11.7	9.8
Precipitation															4.5
Evaporation		7.1	12.3	11.0	13.1	7.9	11.0	11.0	12.0	15.6	10.0	10.0	121.0	106.1	93.1
Growing Degrees	5	18.9	23.2	25.6	23.8	26.1	26.0	24.8	23.8	21.2	20.0	20.9	254.3	239.8	196.4
	10	13.9	18.2	20.6	18.8	21.1	21.0	19.8	18.8	16.2	15.0	15.9	199.3	184.8	141.4

3rd 10-day period (21-31/08/2019)	Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	69.4	63.0
Precipitation - Reference Evapotranspiration	-69.4	-63.0
Number of Rainy Days	0.0	1.0
Number of Dry Days	14.0	33.0

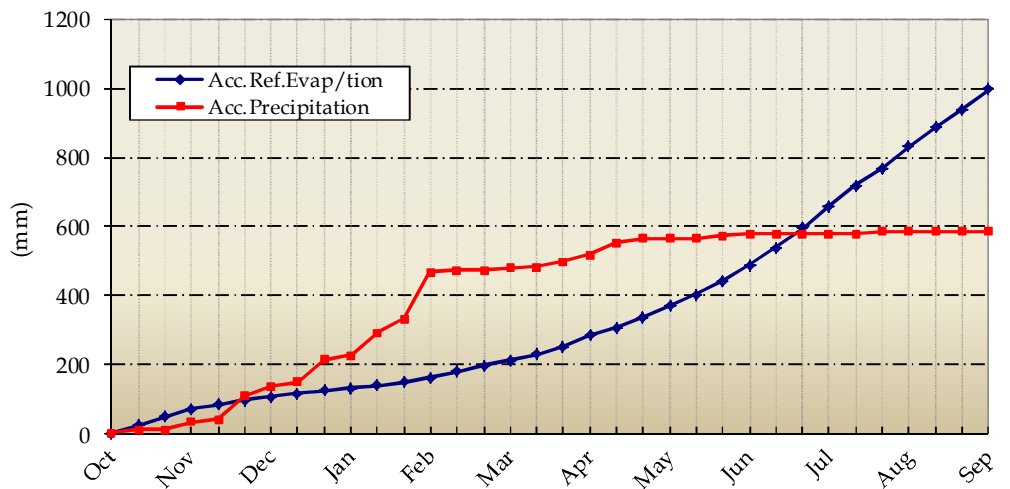
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



3rd 10-day period (21-31/08/2019)		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	32.8	36.8	38.5	35.7	33.8	35.2	34.8	32.8	34.7	32.8	34.6	31.5	30.0
	Min	18.0	17.2	18.4	20.0	19.0	19.0	19.3	18.8	16.0	15.8	16.1	18.0	20.0	18.5
Relative Humidity	Max	86	93	90	64	83	87	83	85	75	80	76	82	86	-
	Min	28	32	18	16	25	26	26	23	20	17	27	23	37	-
Soil Temperature at 10 cm	06 UTC	26.3	28.2	28.4	28.2	29.0	29.0	29.2	28.8	27.8	27.8	27.4	28.2	27.5	26.8
	12 UTC	32.0	30.4	34.6	31.2	31.0	31.0	32.6	30.5	32.0	31.6	29.5	31.5	29.6	30.8
Sunshine Duration		11.6	10.1	11.7	11.5	11.3	11.4	11.3	11.6	11.5	11.4	11.5	11.4	11.2	10.6
Precipitation														32.3	3.8
Evaporation		8.0	9.0	10.2	11.0	8.6	9.2	9.0	10.0	7.1	10.0	8.2	100.3	82.3	74.7
Growing Degrees	5	20.3	20.0	22.6	24.3	22.4	21.4	22.3	21.8	19.4	20.3	19.5	234.0	228.3	211.8
	10	15.3	15.0	17.6	19.3	17.4	16.4	17.3	16.8	14.4	15.3	14.5	179.0	173.3	156.8

3rd 10-day period (21-31/08/2019)	Previous Year Value	Past Years Mean Value	
Reference Evapotranspiration	57.8	52.6	49.7
Precipitation - Reference Evapotranspiration	-57.8	-20.3	-45.9
Number of Rainy Days	0.0	2.0	0.7
Number of Dry Days	46.0	9.0	-

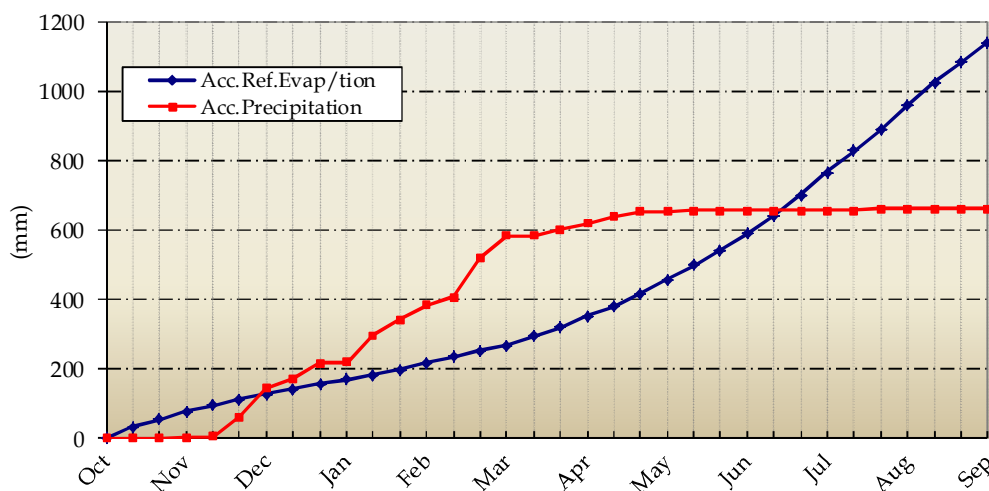
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



3rd 10-day period (21-31/08/2019)		21	22	23	24	25	26	27	28	29	30	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	27.6	28.4	28.6	28.8	29.2	30.0	28.8	28.4	28.2	27.6	27.0	28.4	29.0	27.8
	Min	22.4	22.0	22.8	22.6	23.0	22.6	22.0	23.4	25.0	21.6	23.6	22.8	22.5	21.3
Relative Humidity	Max	81	81	76	78	78	80	77	75	74	77	73	77	84	-
	Min	63	59	60	60	62	59	61	55	56	57	52	59	60	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sunshine Duration		11.6	12.0	11.3	11.1	11.0	11.3	11.0	11.9	11.3	12.0	11.7	11.5	10.2	10.8
Precipitation														11.1	0.6
Evaporation		5.6	7.2	6.8	7.2	4.9	6.8	5.9	6.5	8.4	6.3	8.3	73.9	65.0	88.9
Growing Degrees	5	20.0	20.2	20.7	20.7	21.1	21.3	20.4	20.9	21.6	19.6	20.3	226.8	228.5	215.1
	10	15.0	15.2	15.7	15.7	16.1	16.3	15.4	15.9	16.6	14.6	15.3	171.8	173.5	160.1

3rd 10-day period (21-31/08/2019)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	59.4	54.4	-
Precipitation - Reference Evapotranspiration	-59.4	-43.3	0.6
Number of Rainy Days	0.0	2.0	0.1
Number of Dry Days	45.0	28.0	-

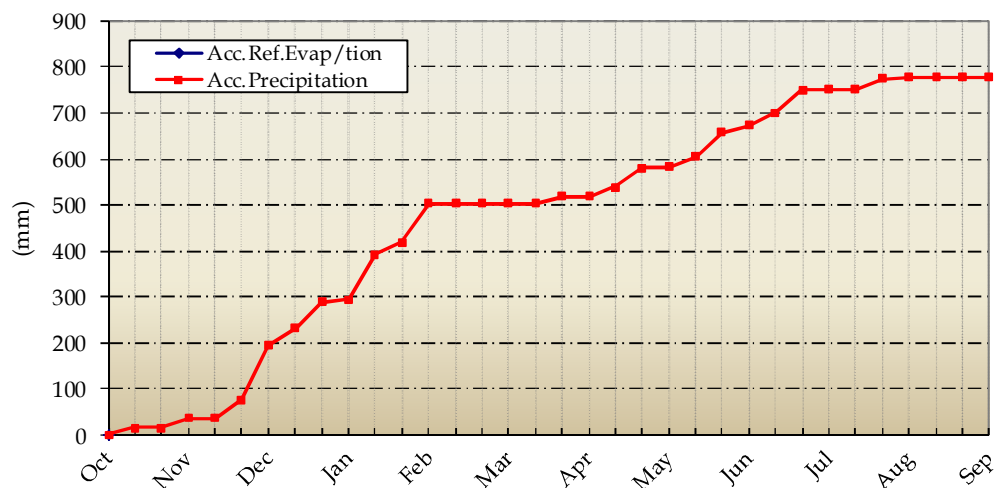
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



3rd 10-day period (21-31/08/2019)		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	35.0	35.8	35.0	37.0	35.4	35.8	33.6	34.8	33.6	33.6	34.8	30.5	29.2
	Min	15.8	17.4	16.4	22.0	17.0	15.0	20.4	17.0	15.4	12.6	14.6	16.7	14.5	14.3
Relative Humidity	Max	97	54	59	87	78	65	80	68	82	71	94	76	98	-
	Min	27	23	27	26	23	20	20	24	19	26	24	24	37	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-	21.9
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-	25.5
Sunshine Duration		10.4	10.3	10.6	10.1	10.3	9.9	9.6	9.9	9.7	8.3	8.9	9.8	7.8	8.9
Precipitation														16.1	15.9
Evaporation		-	-	-	-	-	-	-	-	-	-	-	-	-	70.8
Growing Degrees	5	19.7	21.2	21.1	23.5	22.0	20.2	23.1	20.3	20.1	18.1	19.1	228.4	192.8	178.0
	10	14.7	16.2	16.1	18.5	17.0	15.2	18.1	15.3	15.1	13.1	14.1	173.4	137.8	124.8

3rd 10-day period (21-31/08/2019)	Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	-	44.4
Precipitation - Reference Evapotranspiration	-	-28.5
Number of Rainy Days	0.0	2.1
Number of Dry Days	33.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

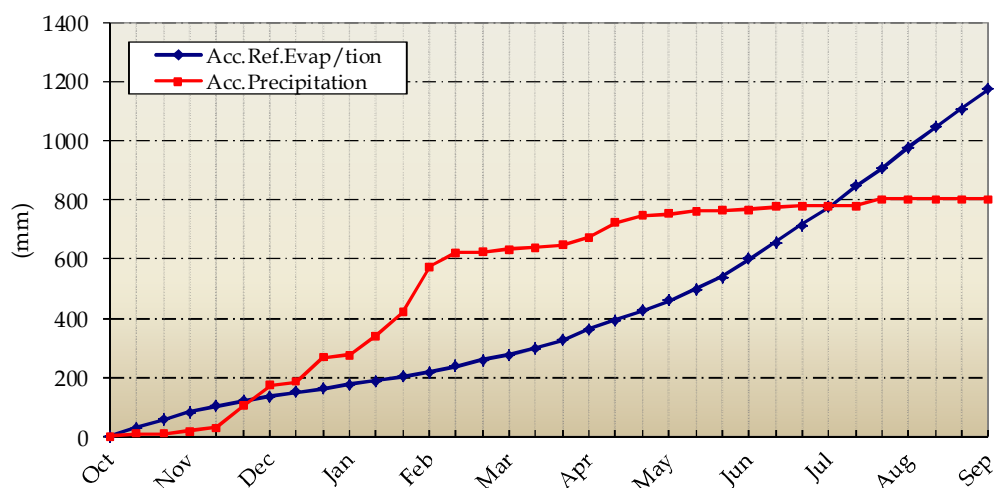


Kalamata

3rd 10-day period (21-31/08/2019)		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	34.1	37.6	34.8	34.6	34.4	33.2	33.1	31.0	32.3	34.8	33.7	32.1	30.5
	Min	16.6	17.7	24.4	23.0	18.8	17.6	19.1	19.8	15.5	17.0	18.4	18.9	19.2	17.7
Relative Humidity	Max	74	77	75	77	82	84	80	74	74	75	65	76	84	-
	Min	40	30	16	20	24	25	32	21	24	21	19	25	35	-
Soil Temperature at 10 cm	06 UTC	28.0	27.7	28.5	28.8	28.6	28.2	28.4	28.4	28.0	27.5	27.6	28.2	27.1	25.4
	12 UTC	30.6	30.6	31.0	29.4	31.2	31.0	31.0	30.8	30.8	30.0	32.1	30.8	29.6	29.0
Sunshine Duration		12.1	11.9	11.9	11.9	11.7	11.4	9.1	12.0	11.0	11.8	9.9	11.3	8.8	10.0
Precipitation														0.2	3.6
Evaporation		6.8	9.6	13.6	10.2	7.6	7.4	8.8	9.8	7.6	6.0	9.8	97.2	73.4	81.7
Growing Degrees	5	18.5	20.9	26.0	23.9	21.7	21.0	21.2	21.5	18.3	19.7	21.6	234.1	227.2	210.0
	10	13.5	15.9	21.0	18.9	16.7	16.0	16.2	16.5	13.3	14.7	16.6	179.1	172.2	155.0

3rd 10-day period (21-31/08/2019)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	68.6	55.5	52.5
Precipitation - Reference Evapotranspiration	-68.6	-55.3	-48.9
Number of Rainy Days	0.0	2.0	0.9
Number of Dry Days	46.0	20.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

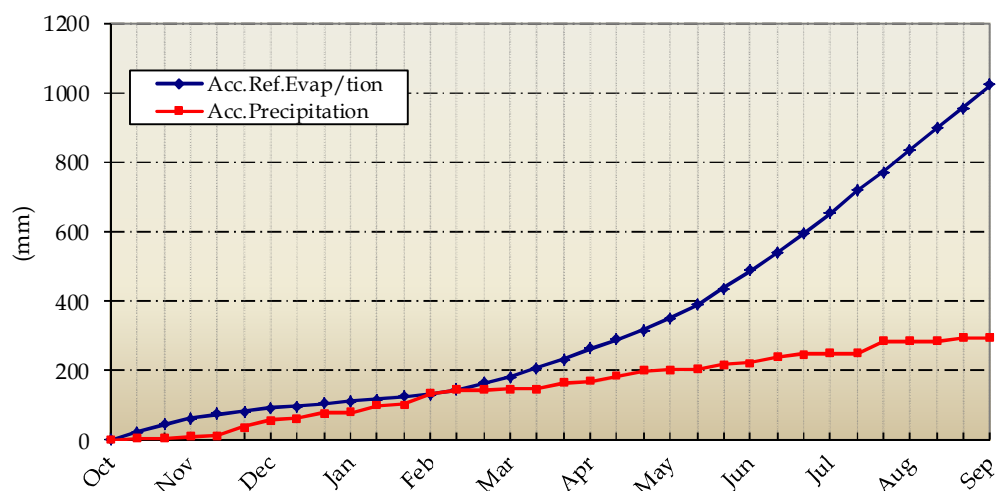


Larisa

3rd 10-day period (21-31/08/2019)		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	35.0	34.6	34.4	34.4	35.6	34.2	33.2	33.6	32.8	33.4	34.1	31.9	31.3
	Min	17.0	17.8	20.4	18.8	18.4	18.0	17.8	17.1	15.8	16.0	17.0	17.6	18.1	16.4
Relative Humidity	Max	82	70	72	66	73	71	74	68	65	70	71	71	84	-
	Min	24	27	24	28	27	23	21	21	21	21	26	24	33	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-	25.5
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-	27.7
Sunshine Duration		10.7	10.4	10.3	10.7	10.3	10.8	10.3	10.4	10.4	10.6	10.5	10.5	9.4	9.7
Precipitation														43.4	8.3
Evaporation		11.3	11.1	11.1	11.0	14.2	13.3	12.4	10.8	12.9	10.6	9.3	128.0	93.2	85.2
Growing Degrees	5	20.3	21.4	22.5	21.6	21.4	21.8	21.0	20.2	19.7	19.4	20.2	229.5	219.8	207.5
	10	15.3	16.4	17.5	16.6	16.4	16.8	16.0	15.2	14.7	14.4	15.2	174.5	164.8	152.5

3rd 10-day period (21-31/08/2019)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	65.6	52.7	54.4
Precipitation - Reference Evapotranspiration	-65.6	-9.3	-46.1
Number of Rainy Days	0.0	2.0	1.6
Number of Dry Days	14.0	23.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

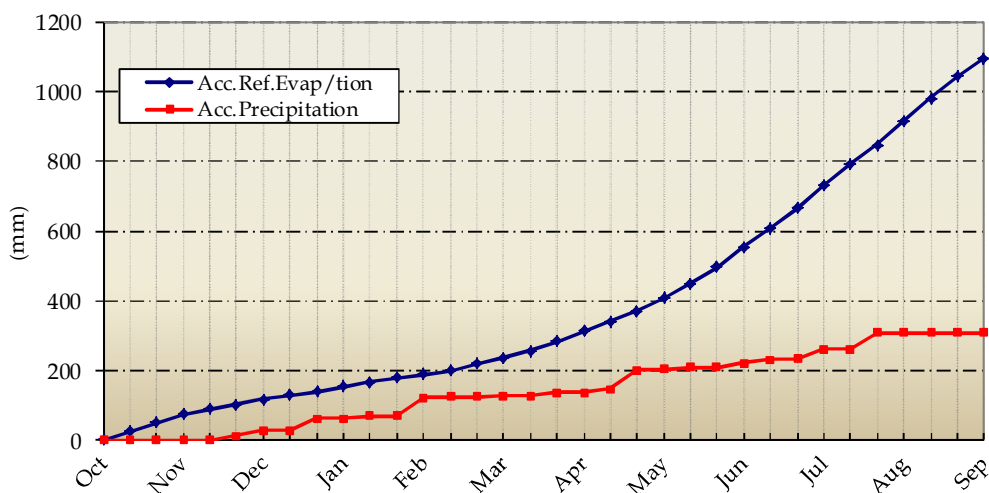


Mikra

3rd 10-day period (21-31/08/2019)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	33.2	35.0	35.1	34.4	34.2	36.6	34.2	32.7	32.2	33.1	31.5	33.8	32.1	29.9
	Min	19.8	21.1	23.6	25.0	22.5	21.0	21.6	20.8	19.2	18.9	21.1	21.3	20.4	17.9
Relative Humidity	Max	80	72	69	68	75	74	70	66	72	60	66	70	70	-
	Min	27	28	28	33	29	21	26	29	29	24	42	29	30	-
Soil Temperature at 10 cm	06 UTC	28.0	28.2	29.2	29.6	29.0	29.0	29.2	28.6	28.2	27.6	27.8	28.6	26.9	25.1
	12 UTC	31.2	32.5	32.2	32.6	32.0	32.5	32.5	32.5	31.0	31.0	31.2	31.9	30.7	29.4
Sunshine Duration		11.9	11.4	11.6	12.5	12.7	11.4	11.3	11.2	12.4	11.6	11.3	11.8	10.1	9.2
Precipitation														3.1	10.5
Evaporation		-	-	-	-	-	-	-	-	-	-	-	-	89.5	84.9
Growing Degrees	5	21.5	23.1	24.4	24.7	23.4	23.8	22.9	21.8	20.7	21.0	21.3	248.4	233.4	208.0
	10	16.5	18.1	19.4	19.7	18.4	18.8	17.9	16.8	15.7	16.0	16.3	193.4	178.4	153.0

3rd 10-day period (21-31/08/2019)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	53.3	59.4	53.4
Precipitation - Reference Evapotranspiration	-53.3	-56.3	-42.9
Number of Rainy Days	0.0	2.0	1.6
Number of Dry Days	16.0	23.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

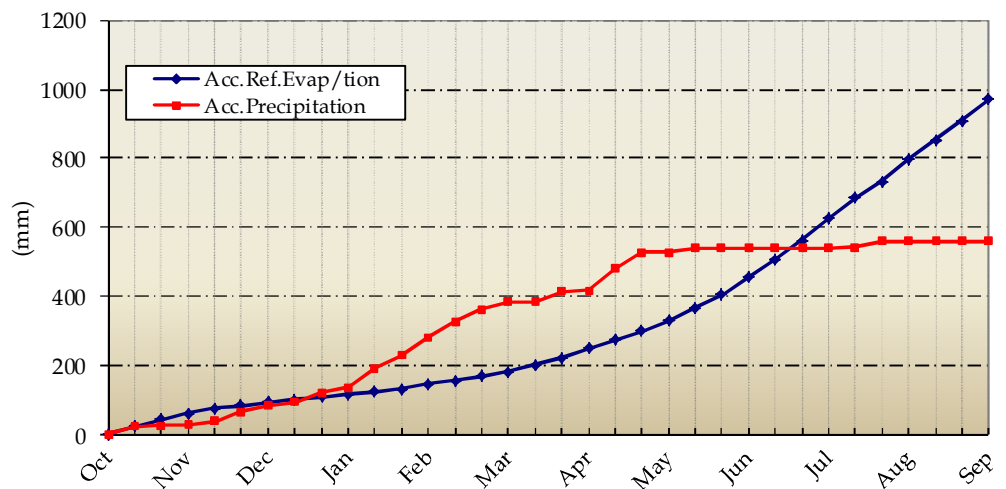




3rd 10-day period (21-31/08/2019)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	31.0	33.5	32.7	32.4	32.9	32.4	32.3	30.8	30.4	30.4	29.0	31.6	30.4	30.9
	Min	18.9	20.0	21.4	23.8	22.8	21.9	22.7	21.5	20.4	18.0	18.4	20.9	19.1	17.4
Relative Humidity	Max	64	58	55	61	62	55	65	62	52	66	63	60	77	-
	Min	26	25	26	31	25	32	27	24	16	24	26	26	32	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sunshine Duration		12.1	11.9	11.8	11.8	12.6	10.9	10.9	12.1	13.1	11.8	12.2	11.9	9.7	
Precipitation														37.9	5.9
Evaporation		-	-	-	-	-	-	-	-	-	-	-	-	-	-
Growing Degrees	5	20.0	21.8	22.1	23.1	22.9	22.2	22.5	21.2	20.4	19.2	18.7	233.8	217.2	
	10	15.0	16.8	17.1	18.1	17.9	17.2	17.5	16.2	15.4	14.2	13.7	178.8	162.2	

3rd 10-day period (21-31/08/2019)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	62.9	55.5	
Precipitation - Reference Evapotranspiration	-62.9	-17.6	5.9
Number of Rainy Days	0.0	4.0	1.0
Number of Dry Days	45.0	25.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

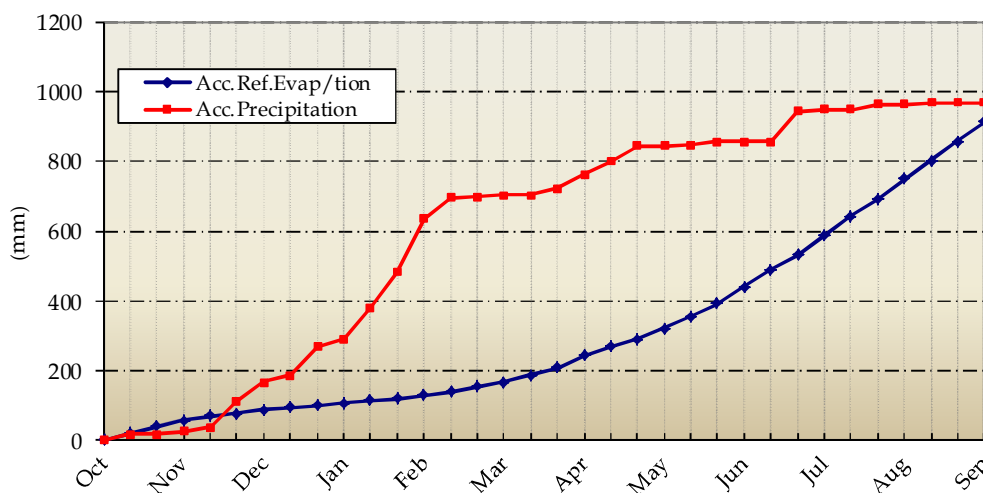


Tripoli

3rd 10-day period (21-31/08/2019)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	30.8	31.3	31.0	33.2	32.8	34.9	32.6	30.5	31.0	29.2	28.2	31.4	29.3	29.3
	Min	19.1	15.6	23.3	23.4	16.5	14.4	16.7	15.4	12.7	10.5	17.8	16.9	14.1	13.3
Relative Humidity	Max	70	73	47	62	74	81	75	68	67	77	70	69	89	-
	Min	22	29	24	18	22	13	16	17	10	22	23	20	29	-
Soil Temperature at 10 cm	06 UTC	25.8	26.2	27.4	-	-	26.2	26.6	25.8	24.8	24.2	-	25.9	23.8	23.4
	12 UTC	32.2	33.2	33.2	-	-	33.8	34.0	33.4	33.0	31.8	-	33.1	29.3	26.2
Sunshine Duration		12.0	11.9	11.2	11.6	10.8	11.1	9.6	11.8	11.9	11.7	11.5	11.4	9.5	9.5
Precipitation														0.0	5.3
Evaporation		8.3	11.6	-	-	-	2.5	11.5	9.6	9.7	-	-	-	-	54.7
Growing Degrees	5	20.0	18.5	22.2	23.3	19.7	19.7	19.7	18.0	16.9	14.9	18.0	210.5	183.8	179.5
	10	15.0	13.5	17.2	18.3	14.7	14.7	14.7	13.0	11.9	9.9	13.0	155.5	128.8	124.5

3rd 10-day period (21-31/08/2019)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	58.5	45.7	47.4
Precipitation - Reference Evapotranspiration	-58.5	-45.7	-42.1
Number of Rainy Days	0.0	0.0	1.2
Number of Dry Days	26.0	14.0	-

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<sub>n</sub> 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

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