



# AGROMETEOROLOGICAL BULLETIN

*November 2016*  
*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



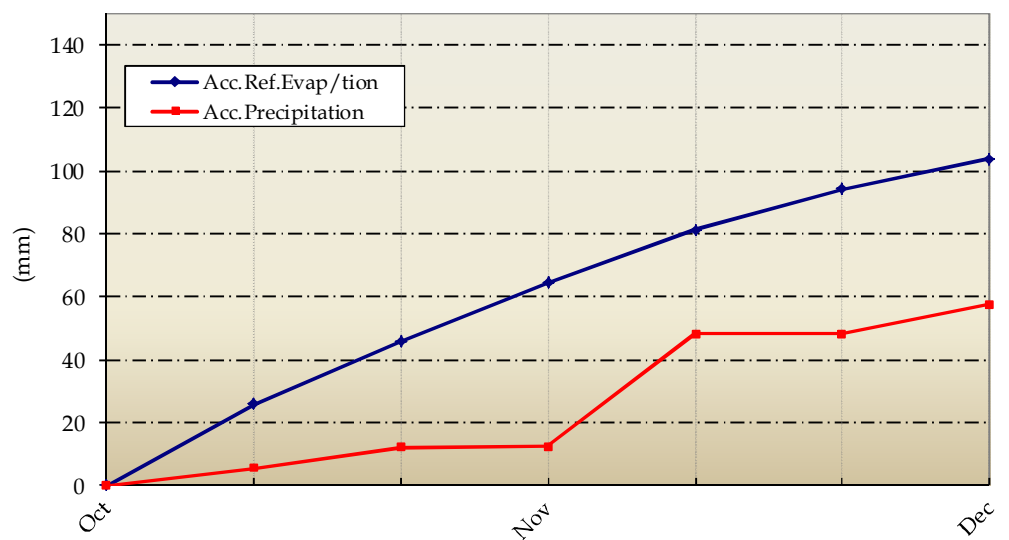
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3rd 10-day period (21-30/11/2016)		21	22	23	24	25	26	27	28	29	30	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	15.4	14.4	15.2	14.8	12.4	11.6	14.8	13.6	9.0	5.4	12.7	17.7	12.8
	Min	5.0	9.0	9.6	4.0	1.8	6.6	8.0	9.0	2.4	1.4	5.7	12.2	5.0
Relative Humidity	Max	86	74	79	87	89	89	95	98	86	61	84	92	-
	Min	55	54	49	49	72	71	86	75	60	34	60	69	-
Soil Temperature at 10 cm	06 UTC	8.9	11.4	7.7	9.2	8.8	10.6	11.0	12.0	8.6	5.6	9.4	14.2	8.6
	12 UTC	12.7	13.2	14.6	13.2	11.2	11.4	12.0	13.8	8.2	7.0	11.7	15.7	10.3
Sunshine Duration		5.0	0.0	4.3	7.9	0.0	0.0	0.0	0.0	0.0	1.6	1.9	3.1	3.2
Precipitation								0.4	8.3	0.8	0.0	9.5	49.0	32.9
Evaporation		1.4	3.2	1.6	2.5	0.5	1.8	0.5	0.2	2.6	0.0	14.3	23.8	16.3
Growing Degrees	5	5.2	6.7	7.4	4.4	2.1	4.1	6.4	6.3	0.7	0.0	43.3	99.3	42.5
	10	0.2	1.7	2.4	0.0	0.0	0.0	1.4	1.3	0.0	0.0	7.0	53.3	11.5

3rd 10-day period (21-30/11/2016)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	9.6	12.5	9.6
Precipitation - Reference Evapotranspiration	-0.1	36.5	23.3
Number of Rainy Days	3.0	3.0	3.3
Number of Dry Days	16.0	32.0	-

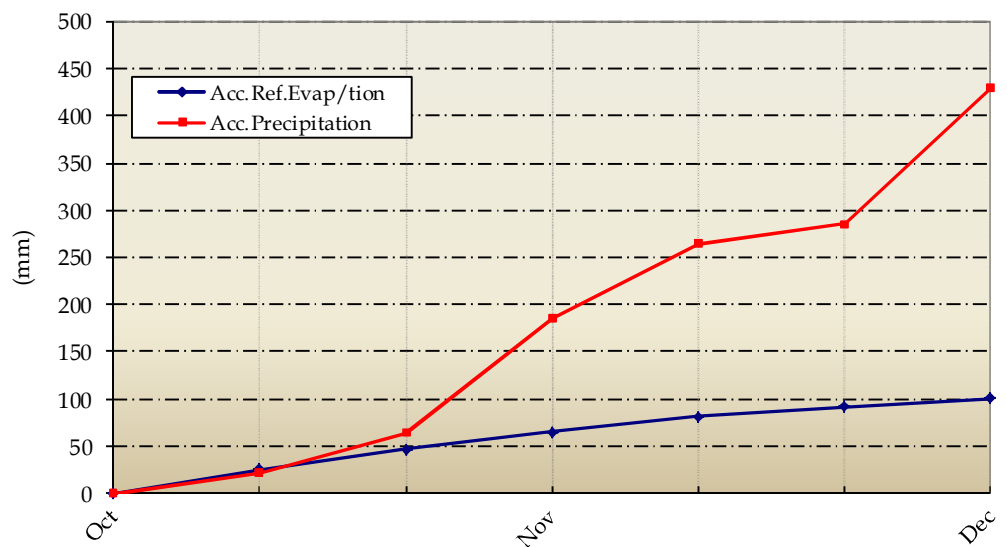
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



3rd 10-day period (21-30/11/2016)		21	22	23	24	25	26	27	28	29	30	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	20.2	20.1	19.4	19.2	17.9	16.8	16.4	19.8	14.0	12.6	17.6	19.6	17.0
	Min	10.4	7.7	5.8	5.2	7.6	11.6	10.5	11.0	8.0	6.5	8.4	13.0	8.6
Relative Humidity	Max	90	90	91	92	92	92	93	92	92	91	92	88	-
	Min	47	48	48	52	66	75	71	57	73	52	59	56	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	11.7
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	13.4
Sunshine Duration		4.6	7.6	7.7	6.6	0.4	0.0	0.0	0.0	0.0	0.0	2.7	3.4	4.6
Precipitation							21.6	37.8	64.0	16.5	4.5	144.4	64.8	62.9
Evaporation		1.0	3.2	0.8	1.0	2.0	0.8	1.0	1.8	6.2	2.2	20.0	58.1	20.2
Growing Degrees	5	10.3	8.9	7.6	7.2	7.8	9.2	8.5	10.4	6.0	4.6	80.4	112.7	78.3
	10	5.3	3.9	2.6	2.2	2.8	4.2	3.5	5.4	1.0	0.0	30.8	62.7	31.1

3rd 10-day period (21-30/11/2016)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	9.3	15.3	10.9
Precipitation - Reference Evapotranspiration	135.1	49.5	52.0
Number of Rainy Days	5.0	7.0	5.0
Number of Dry Days	13.0	28.0	-

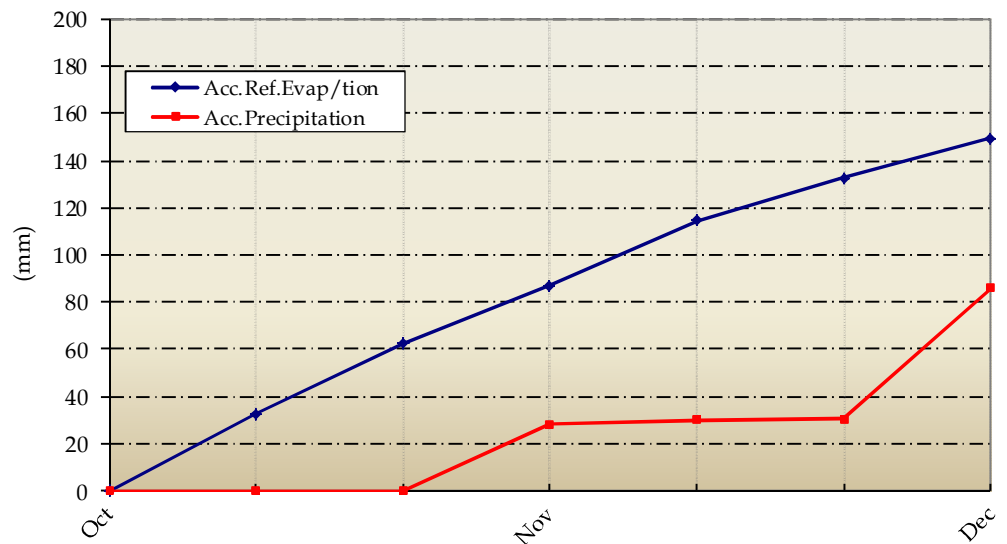
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



3rd 10-day period (21-30/11/2016)		21	22	23	24	25	26	27	28	29	30	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	19.4	19.4	18.4	18.8	19.0	19.4	22.4	22.8	20.0	14.8	19.4	21.8	18.8
	Min	12.8	16.6	16.8	15.6	14.8	11.0	13.0	17.6	18.0	12.4	14.9	15.1	12.7
Relative Humidity	Max	88	79	77	84	84	92	88	72	88	92	84	86	-
	Min	65	68	67	59	62	61	41	47	60	72	60	52	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
Sunshine Duration		5.7	1.9	1.4	1.1	1.3	7.9	8.9	1.9	0.7	0.0	3.1	5.5	4.6
Precipitation										0.0	55.7	55.7	25.4	25.7
Evaporation		1.0	3.2	1.7	0.9	3.1	0.4	2.9	6.8	2.1	1.0	23.1	24.2	32.4
Growing Degrees	5	11.1	13.0	12.6	12.2	11.9	10.2	12.7	15.2	14.0	8.6	121.5	134.6	107.2
	10	6.1	8.0	7.6	7.2	6.9	5.2	7.7	10.2	9.0	3.6	71.5	84.6	57.3

3rd 10-day period (21-30/11/2016)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	17.2	21.3	-
Precipitation - Reference Evapotranspiration	38.5	4.1	25.7
Number of Rainy Days	1.0	5.0	3.7
Number of Dry Days	14.0	32.0	-

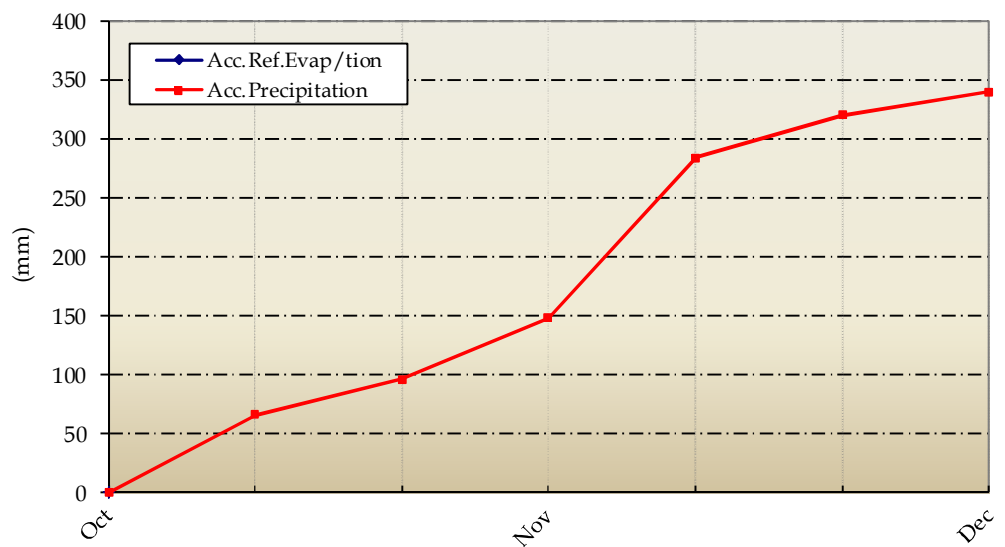
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



3rd 10-day period (21-30/11/2016)		21	22	23	24	25	26	27	28	29	30	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	16.4	16.3	14.0	15.0	12.2	11.5	14.0	12.4	7.9	6.8	12.6	13.6	12.0
	Min	0.5	-1.4	-1.7	-0.2	0.6	5.2	9.0	4.6	5.2	2.0	2.4	7.8	3.6
Relative Humidity	Max	100	100	100	100	100	100	100	100	100	66	97	100	-
	Min	42	47	60	-	70	-	73	83	68	43	61	69	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	7.1
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	8.3
Sunshine Duration		4.3	4.2	6.1	-	1.4	-	0.3	0.0	0.0	3.8	2.5	1.7	2.6
Precipitation							10.3	0.9	7.9	1.1	0.1	20.3	149.5	57.0
Evaporation		-	-	-	-	-	-	-	-	-	-	-	-	9.5
Growing Degrees	5	3.5	2.5	1.2	2.4	1.4	3.4	6.5	3.5	1.6	0.0	25.8	56.7	31.9
	10	0.0	0.0	0.0	0.0	0.0	0.0	1.5	0.0	0.0	0.0	1.5	16.5	4.7

3rd 10-day period (21-30/11/2016)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	-	-	6.7
Precipitation - Reference Evapotranspiration	-	-	50.3
Number of Rainy Days	5.0	9.0	5.1
Number of Dry Days	10.0	29.0	-

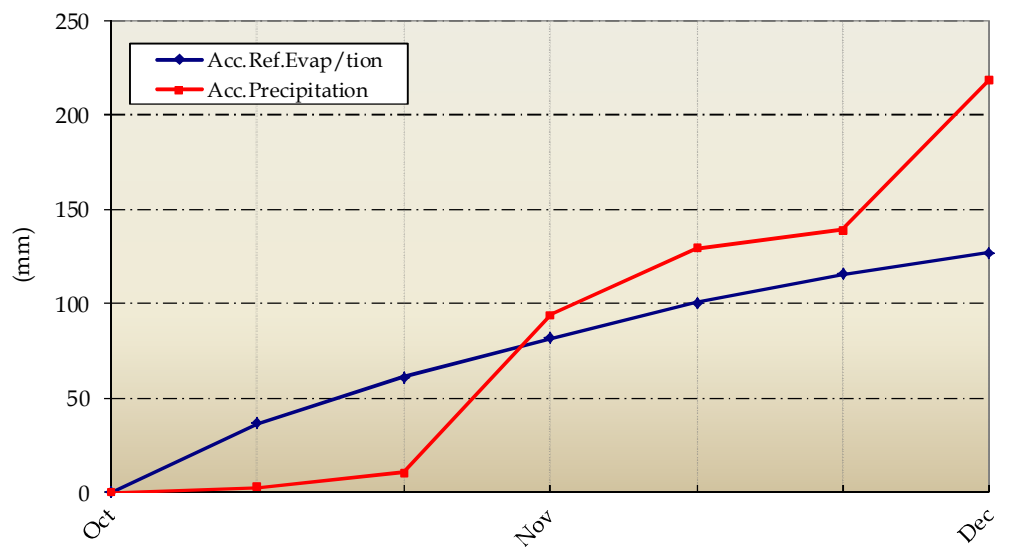
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



3rd 10-day period (21-30/11/2016)		21	22	23	24	25	26	27	28	29	30	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	20.8	21.5	21.4	21.8	19.2	18.5	14.3	20.4	16.7	10.8	18.5	20.4	18.0
	Min	9.9	8.5	8.4	8.4	9.8	10.0	11.4	12.0	10.0	8.6	9.7	11.2	8.3
Relative Humidity	Max	83	86	92	90	92	93	94	94	94	90	91	93	-
	Min	46	41	44	52	56	76	88	69	70	51	59	56	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	16.0	12.7
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	16.3	13.9
Sunshine Duration		4.8	5.3	8.5	7.3	4.4	0.0	0.0	3.5	0.0	0.5	3.4	3.3	4.3
Precipitation							11.5	30.6	30.1	2.0	5.3	79.5	112.7	54.0
Evaporation		2.4	1.8	1.6	1.1	0.0	0.0	0.6	0.0	0.3	1.7	9.5	-	26.0
Growing Degrees	5	10.4	10.0	9.9	10.1	9.5	9.3	7.9	11.2	8.4	4.7	91.2	108.2	81.4
	10	5.4	5.0	4.9	5.1	4.5	4.3	2.9	6.2	3.4	0.0	41.5	58.2	33.0

3rd 10-day period (21-30/11/2016)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	11.4	15.3	12.1
Precipitation - Reference Evapotranspiration	68.1	97.4	41.9
Number of Rainy Days	5.0	8.0	4.8
Number of Dry Days	12.0	19.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

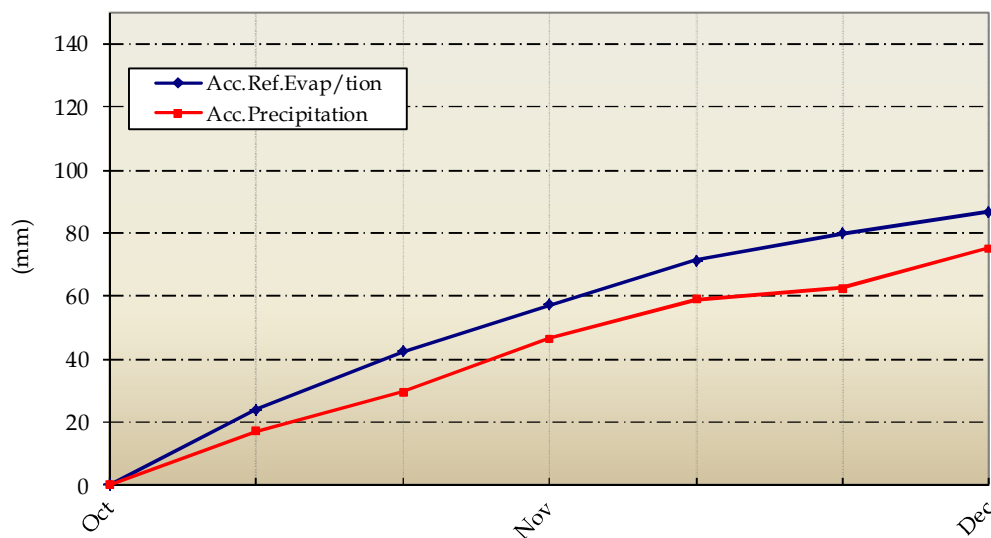


Larisa

3rd 10-day period (21-30/11/2016)		21	22	23	24	25	26	27	28	29	30	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	14.6	14.2	13.6	15.1	12.8	11.7	12.2	13.6	11.2	5.4	12.4	17.2	13.6
	Min	0.7	8.6	8.6	9.0	-0.4	3.4	9.1	9.0	4.2	1.8	5.4	8.1	4.1
Relative Humidity	Max	100	100	100	100	100	100	100	100	94	97	99	97	-
	Min	64	71	69	48	67	78	96	71	67	57	69	58	-
Soil Temperature at 10 cm	06 UTC	11.8	12.6	13.0	13.0	12.4	12.2	12.6	12.8	12.8	11.8	12.5	13.8	9.5
	12 UTC	12.0	12.8	14.0	13.2	12.4	12.2	12.8	12.8	13.0	12.0	12.7	13.7	10.2
Sunshine Duration		5.6	0.0	0.0	4.6	2.0	0.0	0.0	0.4	0.0	0.5	1.3	2.9	3.5
Precipitation							1.7	6.6	3.0	1.2	0.2	12.7	19.1	21.8
Evaporation		0.2	2.1	0.2	0.3	2.6	0.0	0.1	0.1	0.1	0.0	5.7	11.4	10.2
Growing Degrees	5	2.7	6.4	6.1	7.1	1.2	2.6	5.7	6.3	2.7	0.0	40.6	76.7	40.6
	10	0.0	1.4	1.1	2.1	0.0	0.0	0.7	1.3	0.0	0.0	6.5	29.4	8.0

3rd 10-day period (21-30/11/2016)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	7.0	9.7	7.3
Precipitation - Reference Evapotranspiration	5.7	9.4	14.5
Number of Rainy Days	5.0	5.0	3.5
Number of Dry Days	9.0	29.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

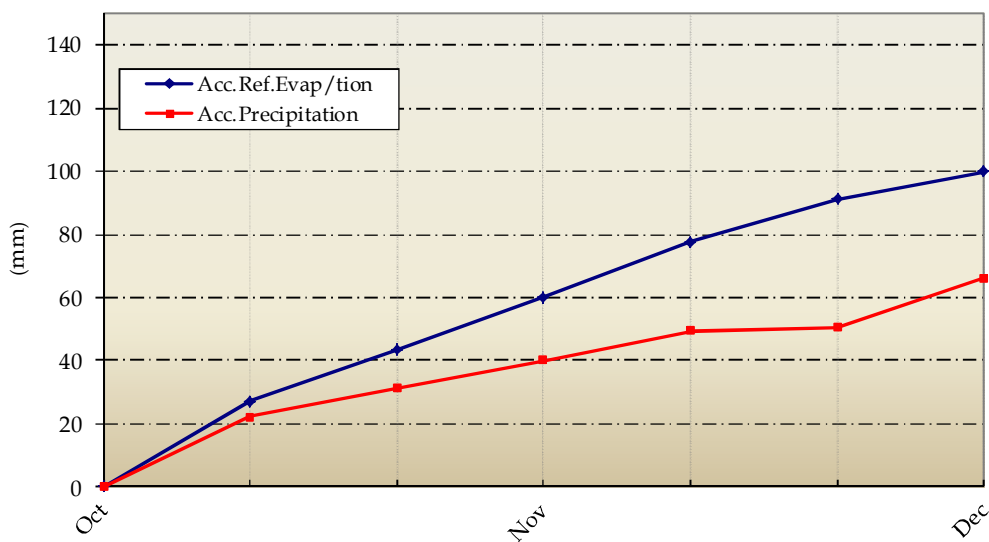


Mikra

3rd 10-day period (21-30/11/2016)		21	22	23	24	25	26	27	28	29	30	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	15.2	14.6	14.2	14.2	13.2	12.4	12.7	14.2	9.0	6.0	12.6	17.2	13.2
	Min	3.5	7.4	8.0	7.0	6.0	5.8	9.6	9.0	3.0	2.2	6.2	10.5	5.2
Relative Humidity	Max	97	92	78	85	91	95	97	96	89	85	90	90	-
	Min	60	56	56	57	61	66	92	70	75	75	67	56	-
Soil Temperature at 10 cm	06 UTC	9.4	10.8	11.8	12.4	11.2	11.1	12.0	12.8	9.2	6.6	10.7	12.8	8.8
	12 UTC	11.4	12.6	12.6	13.4	12.6	12.4	12.0	13.2	8.4	7.0	11.6	14.2	10.6
Sunshine Duration		6.6	0.8	0.0	0.0	0.2	0.3	0.0	0.0	0.0	3.1	1.1	4.0	3.5
Precipitation							0.0	5.0	3.7	5.9	0.9	15.5	36.7	21.0
Evaporation		0.9	0.3	0.7	1.1	1.0	0.3	0.1	0.2	2.7	11.2	18.5	56.4	15.7
Growing Degrees	5	4.4	6.0	6.1	5.6	4.6	4.1	6.2	6.6	1.0	0.0	44.5	88.5	43.9
	10	0.0	1.0	1.1	0.6	0.0	0.0	1.2	1.6	0.0	0.0	5.5	39.3	10.2

3rd 10-day period (21-30/11/2016)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	8.9	13.6	9.9
Precipitation - Reference Evapotranspiration	6.6	23.1	11.1
Number of Rainy Days	4.0	3.0	3.6
Number of Dry Days	11.0	31.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



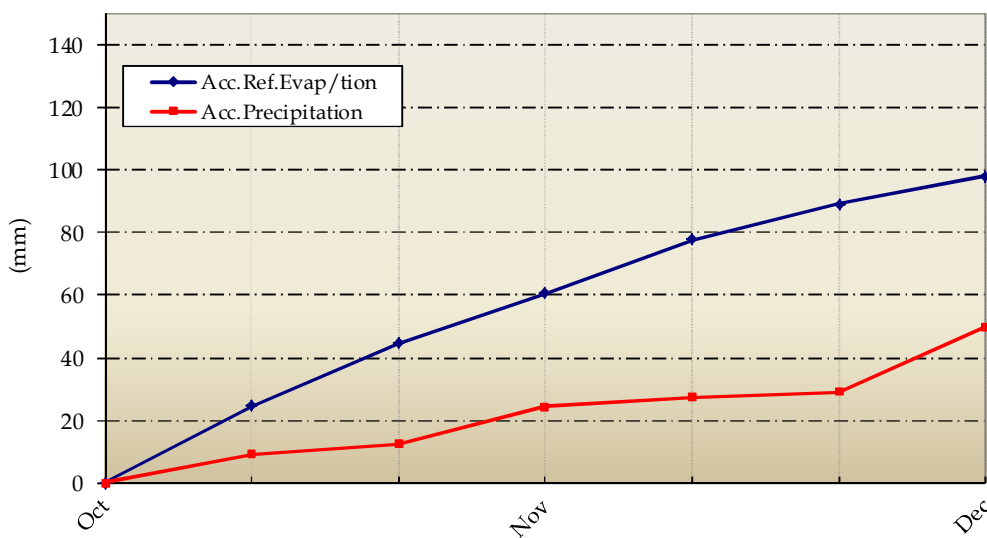


Tanagra

3rd 10-day period (21-30/11/2016)		21	22	23	24	25	26	27	28	29	30	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	16.2	16.2	14.6	16.6	14.7	15.8	16.7	17.6	11.4	6.8	14.7	19.3	15.7
	Min	6.9	8.9	9.4	10.7	5.0	8.0	10.4	11.3	11.0	5.1	8.7	10.6	6.7
Relative Humidity	Max	96	82	68	91	96	98	100	100	84	95	91	92	-
	Min	53	48	49	45	59	68	19	62	71	61	54	47	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
Sunshine Duration		1.3	3.3	0.0	6.5	0.4	0.1	0.2	3.9	0.0	0.3	1.6	5.1	
Precipitation								3.7	14.1	1.9	1.2	20.9	55.2	23.8
Evaporation		-	-	-	-	-	-	-	-	-	-	-	33.0	
Growing Degrees	5	6.6	7.6	7.0	8.7	4.9	6.9	8.6	9.5	6.2	1.0	66.7	99.7	
	10	1.6	2.6	2.0	3.7	0.0	1.9	3.6	4.5	1.2	0.0	20.9	50.1	

3rd 10-day period (21-30/11/2016)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	8.9	12.9	
Precipitation - Reference Evapotranspiration	12.0	42.3	23.8
Number of Rainy Days	4.0	4.0	3.9
Number of Dry Days	10.0	31.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

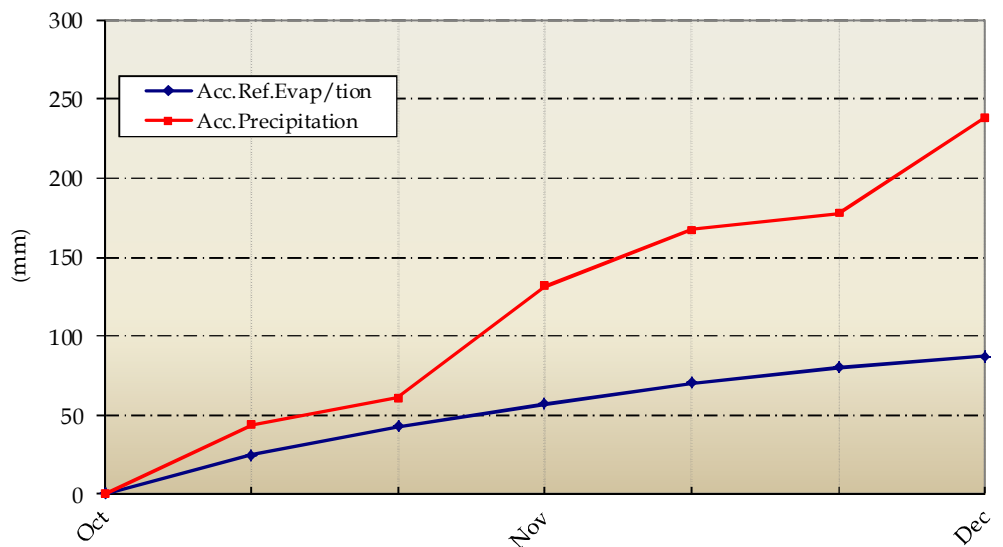


Tripoli

3rd 10-day period (21-30/11/2016)		21	22	23	24	25	26	27	28	29	30	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	14.4	14.6	14.2	16.2	13.0	12.8	12.2	14.1	11.5	5.8	12.9	15.2	12.9
	Min	1.9	1.8	2.3	3.8	1.6	4.4	6.1	7.6	4.8	1.2	3.6	6.9	3.6
Relative Humidity	Max	100	100	100	100	100	100	100	100	100	100	100	98	-
	Min	55	54	55	55	80	97	89	90	92	73	74	56	-
Soil Temperature at 10 cm	06 UTC	8.2	7.8	8.4	9.0	8.4	9.0	9.8	10.4	9.6	8.2	8.9	10.8	8.3
	12 UTC	-	10.2	10.8	10.8	9.8	-	-	11.2	11.0	8.0	10.3	11.9	9.4
Sunshine Duration		4.1	7.3	7.4	5.5	1.8	0.2	0.0	1.5	0.0	0.0	2.8	3.8	4.2
Precipitation						0.0	6.2	12.0	32.2	9.8	0.6	60.8	66.6	45.1
Evaporation		1.2	0.3	1.0	0.5	0.0	0.0	10.7	0.9	0.2	0.0	14.8	-	13.0
Growing Degrees	5	3.2	3.2	3.3	5.0	2.3	3.6	4.2	5.9	3.2	0.0	33.7	60.5	35.8
	10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.0	0.0	0.9	14.7	5.3

3rd 10-day period (21-30/11/2016)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	7.2	9.9	9.3
Precipitation - Reference Evapotranspiration	53.6	56.7	35.8
Number of Rainy Days	5.0	5.0	4.7
Number of Dry Days	12.0	29.0	-

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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