



# AGROMETEOROLOGICAL BULLETIN

*November 2015*  
*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



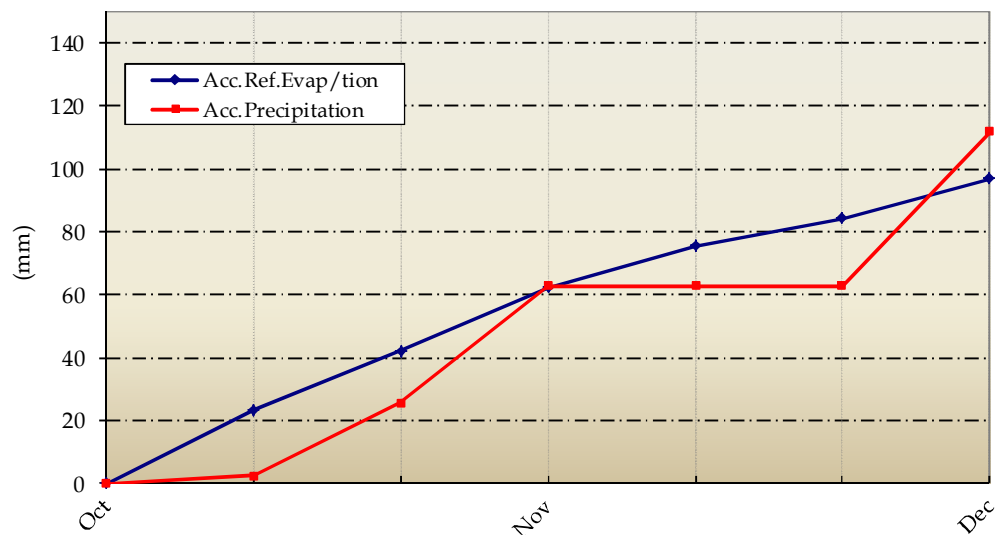
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3rd 10-day period (21-30/11/2015)		21	22	23	24	25	26	27	28	29	30	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	20.0	20.4	19.6	20.0	20.2	18.4	16.0	16.4	12.2	13.4	17.7	11.2	12.8
	Min	15.4	18.0	17.2	16.0	15.2	12.2	11.0	10.6	6.0	0.4	12.2	4.4	5.0
Relative Humidity	Max	92	79	90	96	92	96	96	96	88	96	92	87	-
	Min	75	70	80	69	71	64	79	80	54	45	69	56	-
Soil Temperature at 10 cm	06 UTC	14.6	16.4	17.0	16.4	15.6	15.2	13.6	14.4	10.4	8.0	14.2	8.3	8.6
	12 UTC	16.6	17.8	17.4	18.0	17.8	17.2	15.0	14.4	12.2	11.0	15.7	10.4	10.3
Sunshine Duration		1.9	0.0	0.0	1.7	3.8	6.7	0.8	0.9	7.5	7.9	3.1	3.3	3.2
Precipitation						0.0	4.8	35.1	9.1			49.0	1.4	32.9
Evaporation		2.5	5.5	1.5	0.9	2.9	2.5	1.7	0.1	5.0	1.2	23.8	8.8	16.3
Growing Degrees	5	12.7	14.2	13.4	13.0	12.7	10.3	8.5	8.5	4.1	1.9	99.3	31.2	42.5
	10	7.7	9.2	8.4	8.0	7.7	5.3	3.5	3.5	0.0	0.0	53.3	1.4	11.5

3rd 10-day period (21-30/11/2015)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	12.5	9.3	9.6
Precipitation - Reference Evapotranspiration	36.5	-7.9	23.3
Number of Rainy Days	3.0	2.0	3.3
Number of Dry Days	32.0	8.0	-

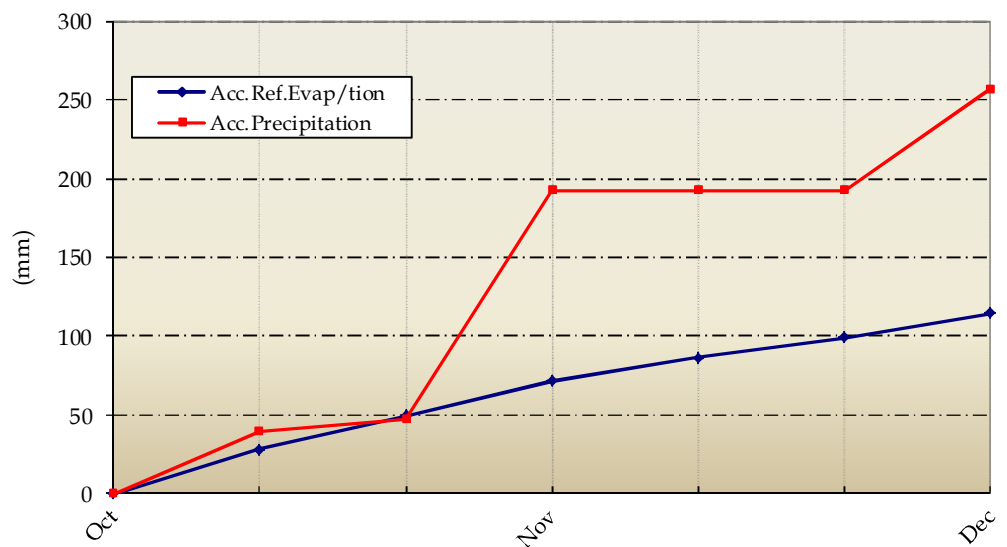
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



3rd 10-day period (21-30/11/2015)		21	22	23	24	25	26	27	28	29	30	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	21.5	21.9	22.6	22.5	21.9	17.2	17.8	17.9	16.7	15.7	19.6	17.7	17.0
	Min	13.8	16.7	15.3	15.4	14.4	12.6	12.3	11.4	10.6	7.2	13.0	7.9	8.6
Relative Humidity	Max	89	91	89	81	91	89	88	87	89	88	88	89	-
	Min	58	61	58	53	60	61	52	58	56	46	56	53	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	13.2	11.7
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	15.4	13.4
Sunshine Duration		1.6	2.9	5.5	4.6	3.8	1.2	1.7	0.0	4.0	8.3	3.4	4.9	4.6
Precipitation		0.7	4.4	4.9		24.4	14.3	12.7	3.4			64.8	25.4	62.9
Evaporation		4.4	4.9	2.0	5.4	7.0	0.0	5.0	12.4	5.0	12.0	58.1	26.3	20.2
Growing Degrees	5	12.7	14.3	14.0	14.0	13.2	9.9	10.1	9.7	8.7	6.5	112.7	78.0	78.3
	10	7.7	9.3	9.0	9.0	8.2	4.9	5.1	4.7	3.7	1.5	62.7	28.6	31.1

3rd 10-day period (21-30/11/2015)	Previous Year Value	Past Years Mean Value	
Reference Evapotranspiration	15.3	9.8	10.9
Precipitation - Reference Evapotranspiration	49.5	15.6	52.0
Number of Rainy Days	7.0	1.0	5.0
Number of Dry Days	28.0	9.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

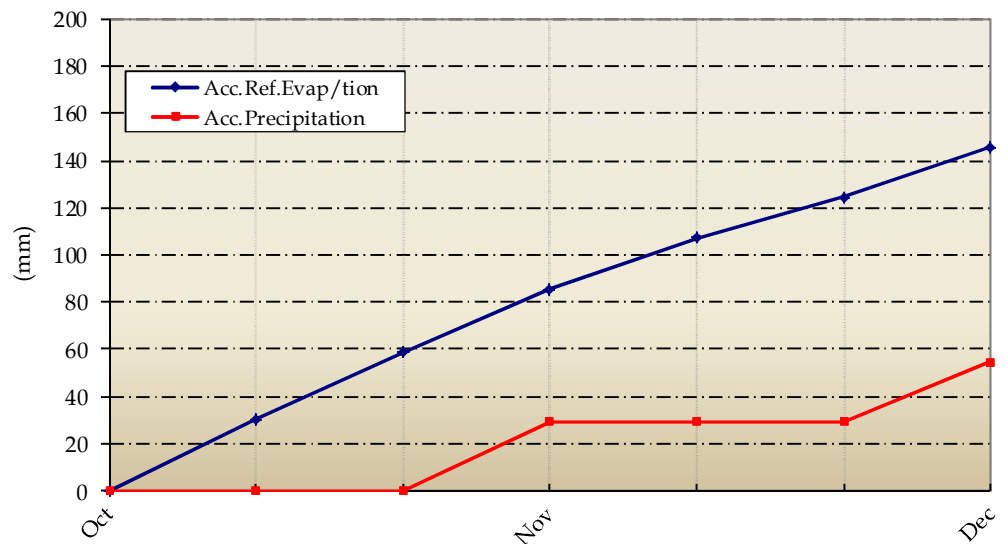


Iraklio

3rd 10-day period (21-30/11/2015)		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	24.2	24.4	22.0	22.0	22.4	20.8	21.2	20.2	16.4	21.8	17.7	18.8
	Min	13.0	17.0	18.0	13.4	16.0	18.0	14.4	14.8	13.8	13.0	15.1	13.5	12.7
Relative Humidity	Max	90	79	84	86	75	91	80	93	91	92	86	80	-
	Min	46	54	45	57	57	46	54	55	53	55	52	57	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
Sunshine Duration		8.0	6.2	3.7	7.8	2.4	6.0	5.8	4.9	6.6	3.4	5.5	3.4	4.6
Precipitation							0.3	0.3	11.8	2.0	11.0	25.4	0.8	25.7
Evaporation		4.0	2.7	1.8	1.1	3.7	1.2	1.1	1.1	3.5	4.0	24.2	25.8	32.4
Growing Degrees	5	13.6	15.6	16.2	12.7	14.0	15.2	12.6	13.0	12.0	9.7	134.6	105.8	107.2
	10	8.6	10.6	11.2	7.7	9.0	10.2	7.6	8.0	7.0	4.7	84.6	55.8	57.3

3rd 10-day period (21-30/11/2015)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	21.3	19.0	-
Precipitation - Reference Evapotranspiration	4.1	-18.2	25.7
Number of Rainy Days	5.0	2.0	3.7
Number of Dry Days	32.0	4.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

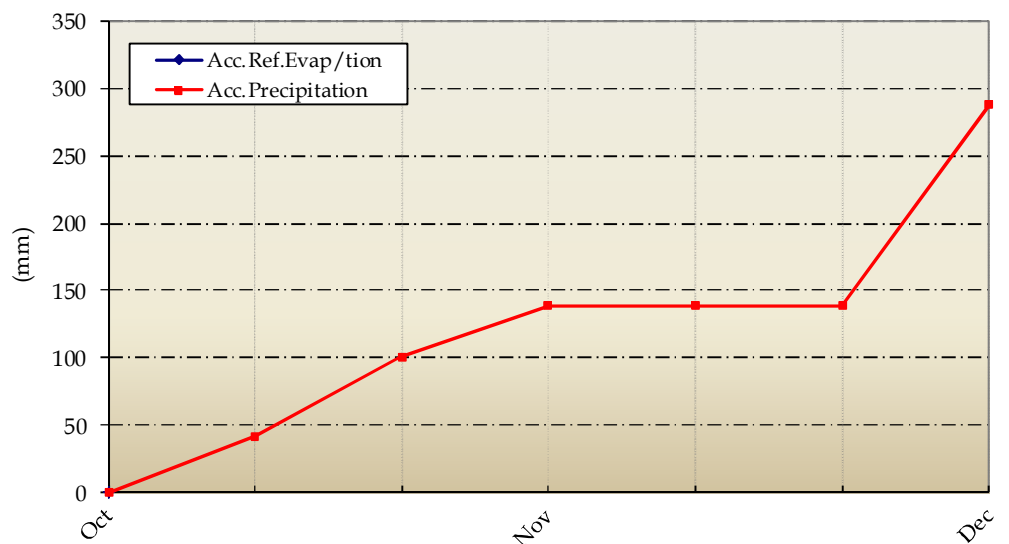


Ioannina

3rd 10-day period (21-30/11/2015)		21	22	23	24	25	26	27	28	29	30	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	14.3	18.1	16.4	16.8	12.7	11.5	10.7	10.8	12.1	12.4	13.6	13.4	12.0
	Min	11.1	12.3	10.0	12.2	9.1	6.3	6.9	5.7	4.7	-0.7	7.8	3.2	3.6
Relative Humidity	Max	100	100	100	100	100	100	100	100	100	100	100	100	-
	Min	83	56	63	67	85	75	80	-	64	44	69	67	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	7.1
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	8.3
Sunshine Duration		-	1.0	3.4	2.2	0.0	-	0.0	-	1.8	3.8	1.7	2.5	2.6
Precipitation		1.4	32.4	2.7	17.4	68.6	7.6	14.3	4.7	0.4		149.5	7.0	57.0
Evaporation		-	-	-	-	-	-	-	-	-	-	-	-	9.5
Growing Degrees	5	7.7	10.2	8.2	9.5	5.9	3.9	3.8	3.3	3.4	0.9	56.7	33.7	31.9
	10	2.7	5.2	3.2	4.5	0.9	0.0	0.0	0.0	0.0	0.0	16.5	8.6	4.7

3rd 10-day period (21-30/11/2015)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	-	5.3	6.7
Precipitation - Reference Evapotranspiration	-	1.7	50.3
Number of Rainy Days	9.0	5.0	5.1
Number of Dry Days	29.0	6.0	-

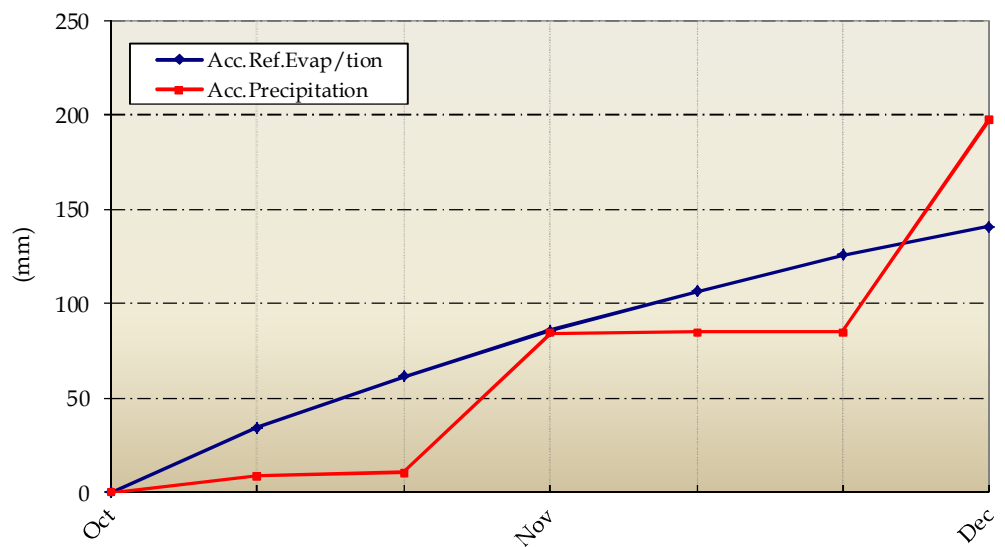
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



3rd 10-day period (21-30/11/2015)		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	22.0	23.1	22.4	21.7	18.8	17.9	18.9	18.2	18.0	20.4	18.5	18.0
	Min	9.9	14.8	16.3	12.2	11.2	10.9	12.0	10.7	7.7	6.6	11.2	8.6	8.3
Relative Humidity	Max	93	92	93	94	94	94	93	94	94	88	93	92	-
	Min	55	64	54	64	65	50	61	58	59	26	56	53	-
Soil Temperature at 10 cm	06 UTC	16.2	16.8	17.2	17.0	16.6	16.4	15.8	15.2	14.6	14.0	16.0	14.2	12.7
	12 UTC	16.8	17.2	17.6	17.4	17.0	16.6	16.0	15.4	15.0	14.0	16.3	14.8	13.9
Sunshine Duration		3.7	2.6	6.2	0.6	3.8	1.6	0.8	2.7	2.6	8.5	3.3	4.5	4.3
Precipitation		0.4	3.2	0.1		39.6	9.5	34.1	25.3	0.5		112.7	9.9	54.0
Evaporation		3.7	-	0.6	0.9	1.4	1.7	1.1	0.3	2.2	2.8	-	-	26.0
Growing Degrees	5	11.5	13.4	14.7	12.3	11.5	9.9	10.0	9.8	8.0	7.3	108.2	85.2	81.4
	10	6.5	8.4	9.7	7.3	6.5	4.9	5.0	4.8	3.0	2.3	58.2	35.2	33.0

3rd 10-day period (21-30/11/2015)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	15.3	12.7	12.1
Precipitation - Reference Evapotranspiration	97.4	-2.8	41.9
Number of Rainy Days	8.0	3.0	4.8
Number of Dry Days	19.0	8.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

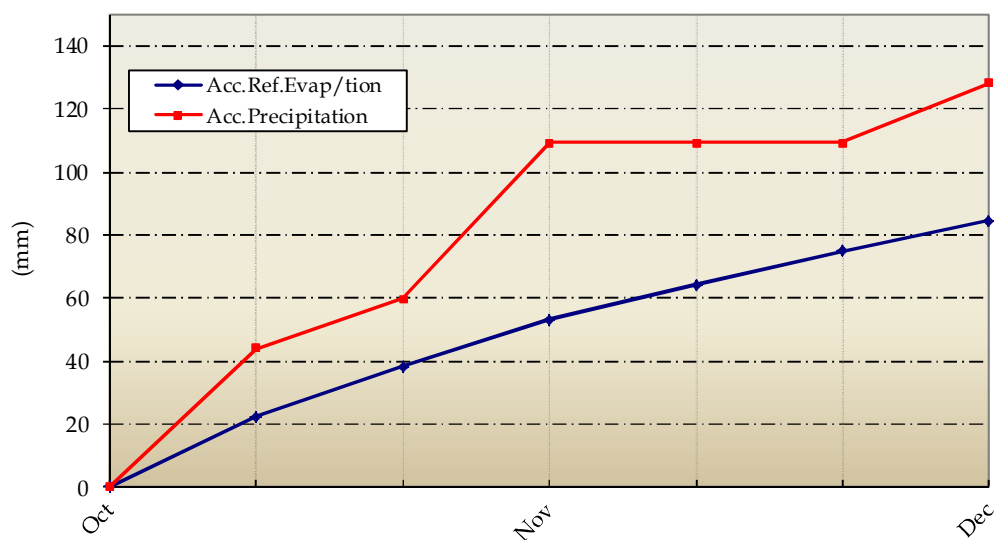


Larisa

3rd 10-day period (21-30/11/2015)		21	22	23	24	25	26	27	28	29	30	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	18.2	23.6	20.6	21.2	17.6	13.3	13.4	15.0	15.0	14.6	17.2	12.6	13.6
	Min	6.8	14.3	13.4	7.6	9.4	8.0	8.8	7.6	4.7	0.2	8.1	4.4	4.1
Relative Humidity	Max	93	77	100	100	100	100	100	100	100	100	97	100	-
	Min	51	32	66	50	68	90	94	57	35	41	58	66	-
Soil Temperature at 10 cm	06 UTC	13.4	13.8	14.8	14.8	14.2	14.0	14.2	13.6	13.0	12.0	13.8	-	9.5
	12 UTC	13.2	14.2	14.8	14.4	14.4	14.2	13.8	13.2	13.0	12.2	13.7	-	10.2
Sunshine Duration		0.0	4.1	0.2	4.1	2.1	0.8	0.0	5.4	5.8	6.6	2.9	3.4	3.5
Precipitation				0.5		11.1	1.3	5.4	0.8			19.1	3.8	21.8
Evaporation		1.5	4.0	0.1	0.2	0.8	1.0	0.0	1.2	1.5	1.1	11.4	10.5	10.2
Growing Degrees	5	7.5	14.0	12.0	9.4	8.5	5.7	6.1	6.3	4.9	2.4	76.7	35.2	40.6
	10	2.5	9.0	7.0	4.4	3.5	0.7	1.1	1.3	0.0	0.0	29.4	2.7	8.0

3rd 10-day period (21-30/11/2015)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	9.7	6.1	7.3
Precipitation - Reference Evapotranspiration	9.4	-2.3	14.5
Number of Rainy Days	5.0	4.0	3.5
Number of Dry Days	29.0	6.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



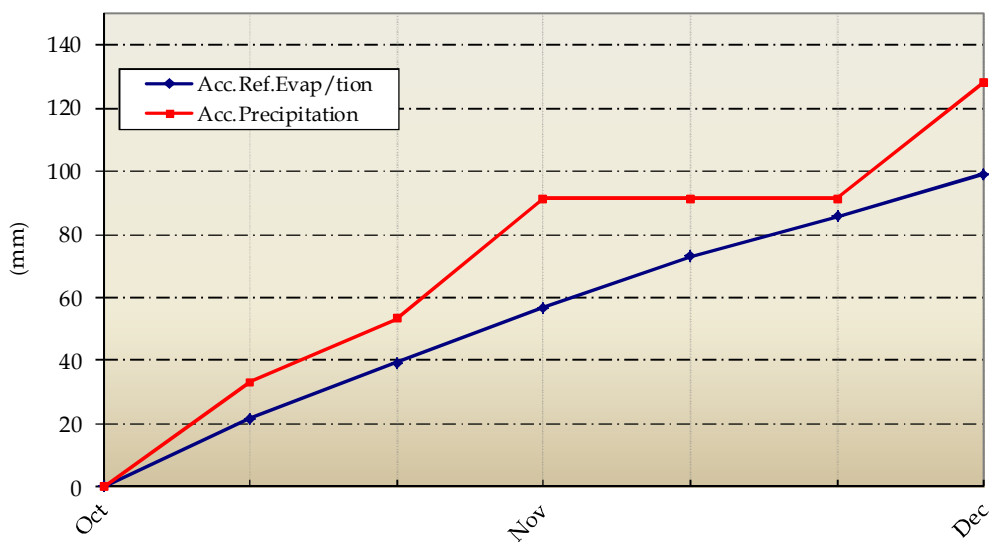


Mikra

3rd 10-day period (21-30/11/2015)		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	24.4	21.0	19.0	18.0	15.2	16.8	14.6	12.4	14.1	17.2	12.5	13.2
	Min	7.0	15.4	16.2	13.0	12.0	8.4	11.0	8.8	6.0	7.2	10.5	6.5	5.2
Relative Humidity	Max	95	66	87	91	95	95	95	95	91	87	90	89	-
	Min	53	40	55	66	66	74	74	59	42	34	56	64	-
Soil Temperature at 10 cm	06 UTC	11.8	13.6	15.6	15.1	14.6	13.2	13.2	12.4	10.6	8.4	12.8	10.2	8.8
	12 UTC	13.0	15.6	16.4	16.4	16.2	14.6	14.0	13.6	11.0	11.6	14.2	11.9	10.6
Sunshine Duration		0.2	5.0	1.3	4.4	3.4	4.3	0.4	6.8	7.4	7.2	4.0	4.1	3.5
Precipitation				0.0		21.2	2.7	12.8				36.7	8.2	21.0
Evaporation		0.4	6.3	2.1	1.6	7.2	5.4	13.4	5.6	7.4	7.0	56.4	12.0	15.7
Growing Degrees	5	6.7	14.9	13.6	11.0	10.0	6.8	8.9	6.7	4.2	5.7	88.5	45.0	43.9
	10	1.7	9.9	8.6	6.0	5.0	1.8	3.9	1.7	0.0	0.7	39.3	6.8	10.2

3rd 10-day period (21-30/11/2015)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	13.6	8.0	9.9
Precipitation - Reference Evapotranspiration	23.1	0.2	11.1
Number of Rainy Days	3.0	5.0	3.6
Number of Dry Days	31.0	5.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



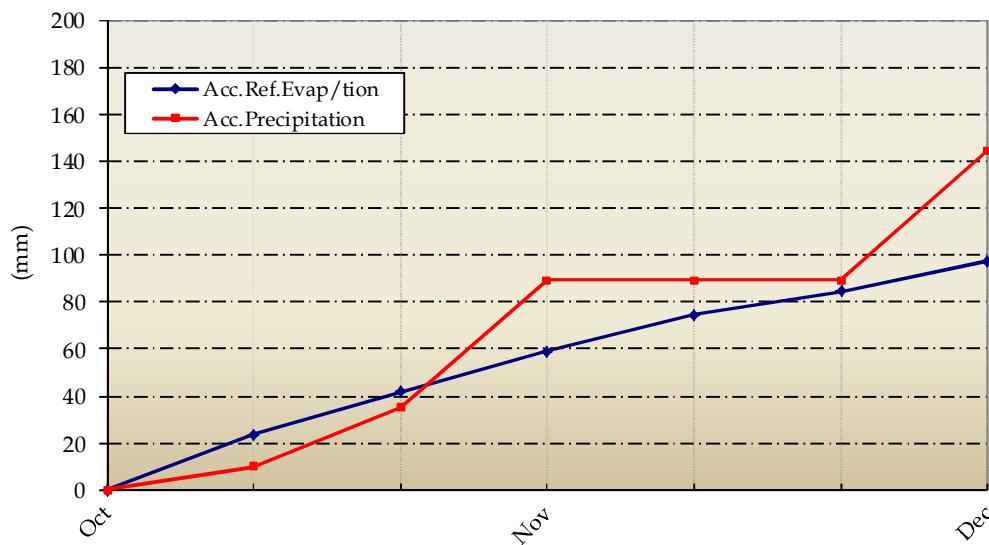


Tanagra

3rd 10-day period (21-30/11/2015)		21	22	23	24	25	26	27	28	29	30	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	21.8	23.1	22.8	22.8	19.6	18.8	18.0	15.8	16.0	14.3	19.3	13.3	15.7
	Min	12.6	18.5	15.6	9.7	7.8	10.0	13.0	9.3	5.0	4.8	10.6	7.0	6.7
Relative Humidity	Max	82	69	97	98	100	97	84	96	95	99	92	96	-
	Min	46	40	43	42	61	46	53	54	50	32	47	65	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
Sunshine Duration		6.8	7.8	4.8	4.9	1.7	5.5	4.5	2.9	4.6	7.3	5.1	2.3	
Precipitation						20.2	29.6	0.7	4.7			55.2	10.7	23.8
Evaporation		4.5	5.5	3.2	3.8	2.0	2.0	4.5	4.0	0.5	3.0	33.0	15.5	
Growing Degrees	5	12.2	15.8	14.2	11.3	8.7	9.4	10.5	7.6	5.5	4.6	99.7	51.6	
	10	7.2	10.8	9.2	6.3	3.7	4.4	5.5	2.6	0.5	0.0	50.1	9.8	

3rd 10-day period (21-30/11/2015)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	12.9	7.4	
Precipitation - Reference Evapotranspiration	42.3	3.3	23.8
Number of Rainy Days	4.0	5.0	3.9
Number of Dry Days	31.0	9.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

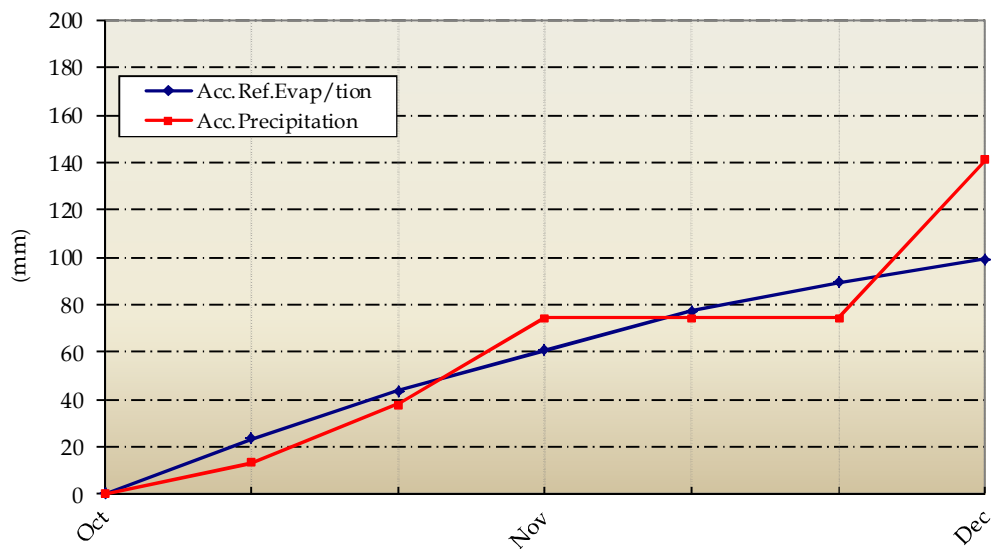


Tripoli

3rd 10-day period (21-30/11/2015)		21	22	23	24	25	26	27	28	29	30	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	17.0	14.3	17.6	17.2	16.8	14.6	12.5	13.6	14.4	13.8	15.2	12.7	12.9
	Min	7.0	12.0	11.5	6.1	6.6	8.4	6.7	6.5	5.7	-1.4	6.9	2.3	3.6
Relative Humidity	Max	93	92	100	100	100	100	100	100	100	100	98	100	-
	Min	65	64	54	48	63	58	73	52	48	32	56	63	-
Soil Temperature at 10 cm	06 UTC	11.2	12.4	12.2	10.8	11.0	11.2	10.2	-	-	7.2	10.8	7.8	8.3
	12 UTC	-	-	13.8	12.8	12.6	12.2	11.4	-	-	8.8	11.9	8.6	9.4
Sunshine Duration		3.5	4.0	4.6	4.6	2.0	2.2	0.7	4.5	4.7	7.3	3.8	4.0	4.2
Precipitation		0.0	3.2	0.0		11.9	5.2	24.2	22.1	0.0		66.6	12.4	45.1
Evaporation		1.3	0.6	0.9	1.6	0.1	0.6	-	-	-	2.2	-	7.8	13.0
Growing Degrees	5	7.0	8.2	9.6	6.7	6.7	6.5	4.6	5.1	5.1	1.2	60.5	27.9	35.8
	10	2.0	3.2	4.6	1.7	1.7	1.5	0.0	0.1	0.1	0.0	14.7	4.4	5.3

3rd 10-day period (21-30/11/2015)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	9.9	7.1	9.3
Precipitation - Reference Evapotranspiration	56.7	5.3	35.8
Number of Rainy Days	5.0	2.0	4.7
Number of Dry Days	29.0	7.0	-

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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