



# AGROMETEOROLOGICAL BULLETIN

*December 2014  
2nd 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



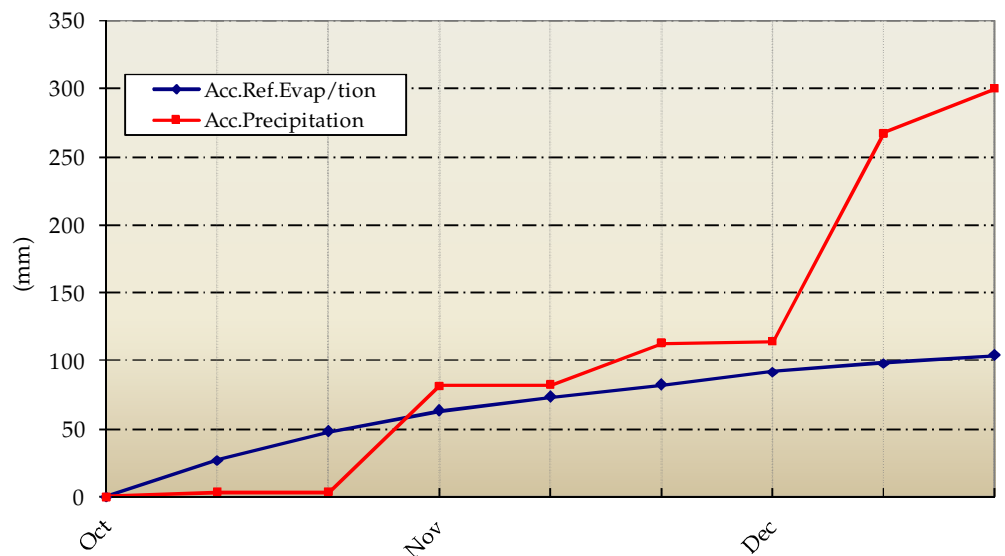
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2nd 10-day period (11-20/12/2014)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	10.2	11.0	11.6	10.8	9.4	11.0	13.2	15.2	14.0	13.8	12.0	8.0	10.6
	Min	6.6	9.0	4.4	-1.4	-1.6	1.2	8.2	8.2	3.6	4.6	4.3	1.1	3.1
Relative Humidity	Max	92	92	93	97	96	97	97	100	93	97	95	85	-
	Min	89	61	47	70	77	78	91	68	66	70	72	60	-
Soil Temperature at 10 cm	06 UTC	9.0	9.6	6.4	5.6	4.4	5.4	9.0	9.6	7.2	7.4	7.4	4.8	6.3
	12 UTC	10.0	9.8	9.2	7.6	7.0	8.4	10.4	11.4	10.4	10.0	9.4	6.3	7.5
Sunshine Duration		0.0	0.0	8.4	7.7	0.5	0.0	0.0	4.4	7.9	5.5	3.4	3.1	2.5
Precipitation		5.4	1.0					24.8	1.2			32.4	0.1	23.7
Evaporation		0.3	0.8	0.0	0.0	0.0	0.5	1.5	0.2	0.9	0.2	4.4	4.7	11.7
Growing Degrees	5	3.4	5.0	3.0	0.0	0.0	1.1	5.7	6.7	3.8	4.2	32.9	9.0	26.7
	10	0.0	0.0	0.0	0.0	0.0	0.0	0.7	1.7	0.0	0.0	2.4	0.0	5.3

2nd 10-day period (11-20/12/2014)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	5.4	6.6	8.1
Precipitation - Reference Evapotranspiration	27.0	-6.5	15.6
Number of Rainy Days	4.0	1.0	2.9
Number of Dry Days	0.0	5.0	-

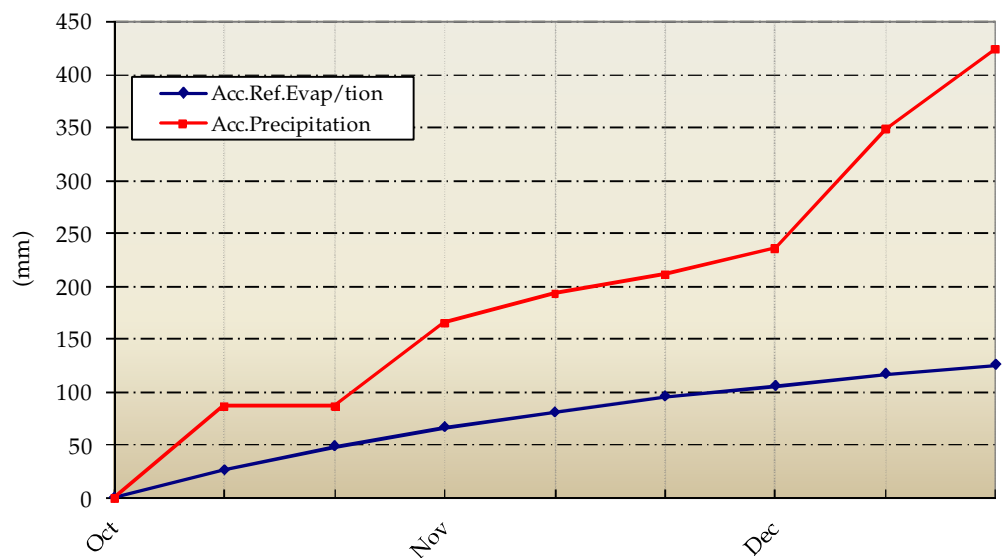
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



2nd 10-day period (11-20/12/2014)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	15.2	17.7	18.0	17.4	16.6	15.4	14.9	16.4	16.8	17.2	16.6	15.0	15.1
	Min	10.7	10.0	4.4	6.5	5.0	10.0	10.0	9.5	5.0	7.0	7.8	3.4	6.8
Relative Humidity	Max	88	86	91	89	87	92	92	92	92	88	90	88	-
	Min	71	50	48	51	58	60	74	57	58	58	58	47	-
Soil Temperature at 10 cm	06 UTC	13.0	12.6	11.4	11.0	11.6	12.6	14.0	12.4	9.2	9.8	11.8	8.6	9.7
	12 UTC	14.4	15.6	15.4	14.2	14.0	13.2	13.6	13.6	13.8	14.2	14.2	11.4	11.2
Sunshine Duration		0.0	6.5	7.6	7.2	5.4	0.0	0.7	5.0	7.7	7.4	4.8	6.9	4.1
Precipitation		3.2					1.5	52.3	18.1			75.1	0.9	43.9
Evaporation		0.2	1.0	3.0	1.0	0.7	0.1	0.0	2.0	4.0	3.0	15.0	11.0	19.6
Growing Degrees	5	8.0	8.9	6.2	7.0	5.8	7.7	7.5	8.0	5.9	7.1	71.9	42.1	59.8
	10	3.0	3.9	1.2	2.0	0.8	2.7	2.5	3.0	0.9	2.1	21.9	6.8	16.6

2nd 10-day period (11-20/12/2014)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	8.6	8.4	9.0
Precipitation - Reference Evapotranspiration	66.5	-7.5	34.9
Number of Rainy Days	4.0	2.0	4.7
Number of Dry Days	0.0	7.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

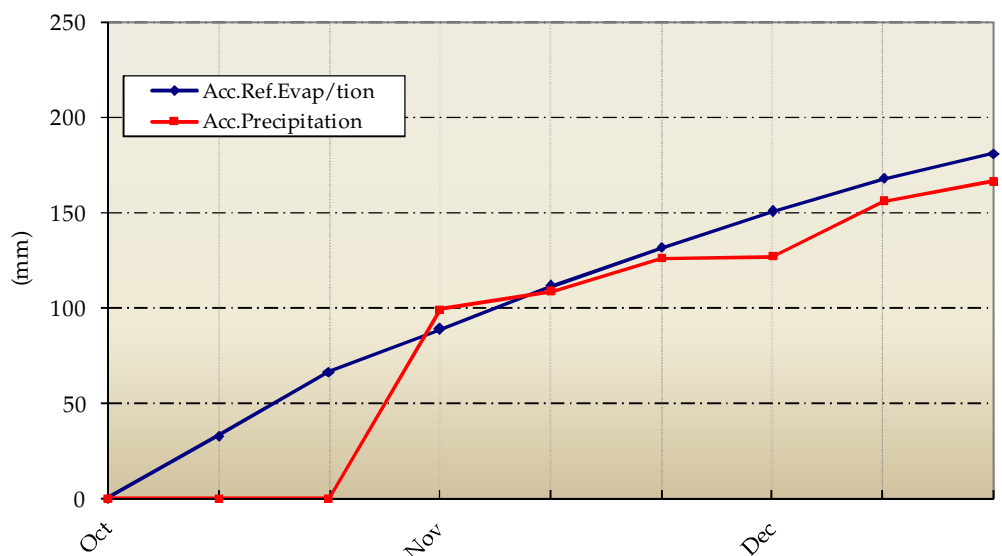


Iraklio

2nd 10-day period (11-20/12/2014)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	20.4	16.8	16.0	16.4	16.8	17.8	20.2	19.6	18.0	17.4	17.9	13.2	16.6
	Min	12.0	11.6	15.0	11.4	12.6	10.8	15.0	11.6	11.0	11.2	12.2	8.4	10.5
Relative Humidity	Max	89	93	82	91	83	83	89	93	93	88	88	84	-
	Min	57	64	66	66	65	68	56	55	68	68	63	63	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
Sunshine Duration		3.0	4.1	0.7	4.1	3.3	1.2	2.6	4.9	4.4	4.5	3.3	1.3	3.8
Precipitation		1.0	4.2	1.3					1.5	1.4	1.0	10.4	34.0	23.4
Evaporation		0.3	1.8	4.0	0.8	0.7	1.1	1.0	1.3	0.7	7.1	18.8	17.6	25.9
Growing Degrees	5	11.2	9.2	10.5	8.9	9.7	9.3	12.6	10.6	9.5	9.3	100.8	58.0	85.7
	10	6.2	4.2	5.5	3.9	4.7	4.3	7.6	5.6	4.5	4.3	50.8	12.6	36.5

2nd 10-day period (11-20/12/2014)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	13.3	14.1	-
Precipitation - Reference Evapotranspiration	-2.9	19.9	23.4
Number of Rainy Days	6.0	7.0	3.8
Number of Dry Days	0.0	2.0	-

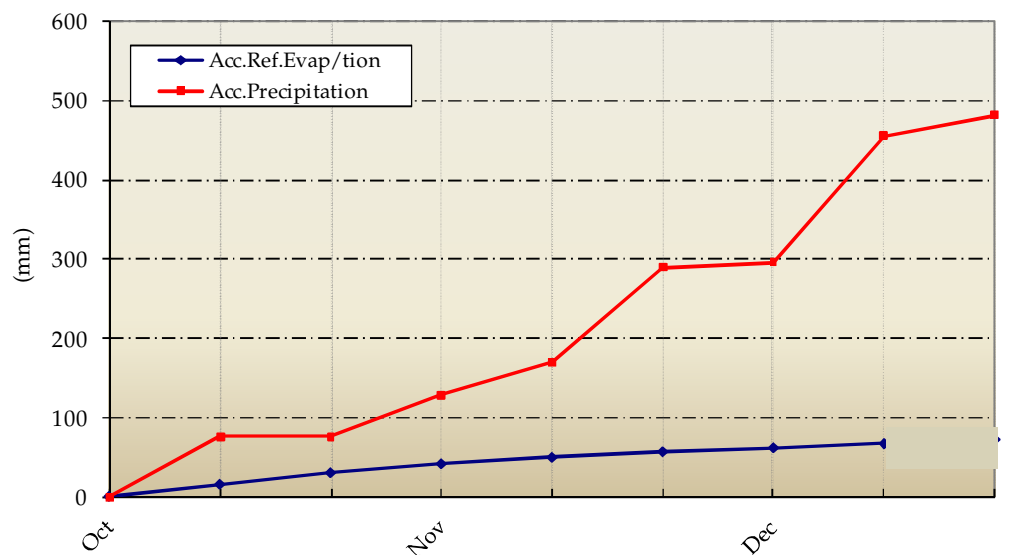
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



2nd 10-day period (11-20/12/2014)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	7.2	15.7	14.8	9.3	8.0	11.9	9.8	13.7	8.0	7.0	10.5	11.3	9.6
	Min	4.6	0.6	-1.3	-1.4	-0.7	6.5	9.2	0.7	0.1	-0.9	1.7	-3.7	1.6
Relative Humidity	Max	100	100	100	100	100	100	100	100	100	-	100	94	-
	Min	-	-	-	-	-	77	-	-	-	-	77	31	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	4.9
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	5.7
Sunshine Duration		-	-	-	-	-	-	-	-	-	-	-	4.9	2.5
Precipitation		0.9	0.0	-	0.0	0.0	0.3	18.5	6.4	0.0	-	26.1	-	54.5
Evaporation		-	-	-	-	-	-	-	-	-	-	-	-	5.5
Growing Degrees	5	0.9	3.2	1.8	0.0	0.0	4.2	4.5	2.2	0.0	0.0	16.7	3.7	16.0
	10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8

2nd 10-day period (11-20/12/2014)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	-	6.0	5.7
Precipitation - Reference Evapotranspiration	-	-6.0	48.8
Number of Rainy Days	4.0	0.0	4.4
Number of Dry Days	2.0	13.0	-

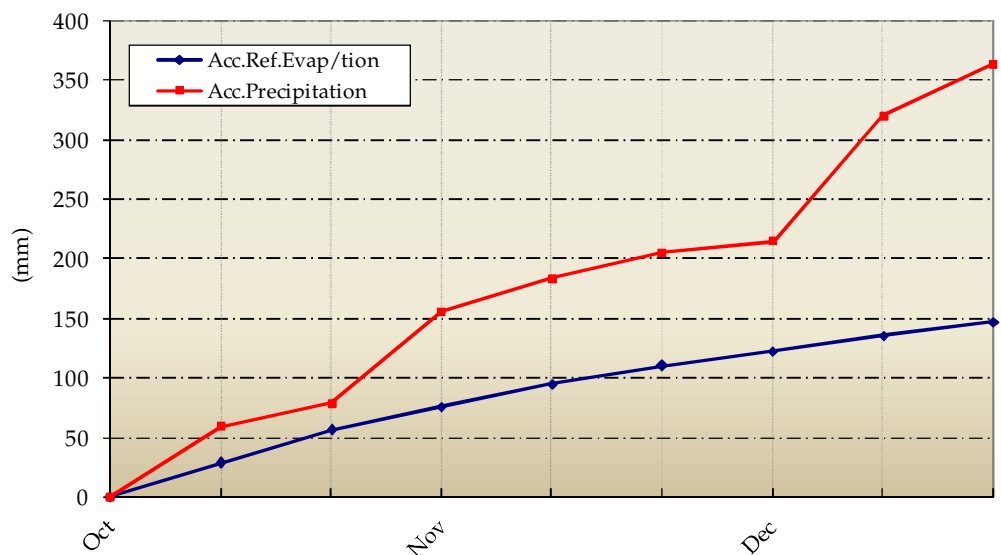
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



2nd 10-day period (11-20/12/2014)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	13.9	17.8	20.8	18.4	17.6	14.4	17.2	16.5	17.3	18.2	17.2	16.2	15.9
	Min	10.3	10.4	7.4	5.4	5.1	7.0	7.5	6.4	5.8	4.4	7.0	4.3	6.6
Relative Humidity	Max	92	84	87	91	94	95	95	96	94	95	92	83	-
	Min	65	55	37	49	50	69	62	69	54	44	55	39	-
Soil Temperature at 10 cm	06 UTC	13.2	12.6	12.6	12.0	11.6	11.4	11.2	11.0	11.4	11.2	11.8	8.7	10.6
	12 UTC	13.0	13.0	12.6	12.0	12.0	12.0	11.8	11.0	11.6	11.6	12.1	9.2	11.5
Sunshine Duration		0.0	2.5	8.1	8.0	6.6	0.1	0.0	2.6	7.6	7.9	4.3	6.3	3.9
Precipitation		6.1	0.2				3.9	24.1	9.4			43.7		53.6
Evaporation		-	-	-	-	-	-	-	-	-	-	-	-	23.9
Growing Degrees	5	7.1	9.1	9.1	6.9	6.4	5.7	7.4	6.5	6.6	6.3	70.9	52.9	62.3
	10	2.1	4.1	4.1	1.9	1.4	0.7	2.4	1.5	1.6	1.3	20.9	7.5	17.2

2nd 10-day period (11-20/12/2014)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	11.3	14.1	10.5
Precipitation - Reference Evapotranspiration	32.4	-14.1	43.1
Number of Rainy Days	5.0	0.0	4.7
Number of Dry Days	0.0	17.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

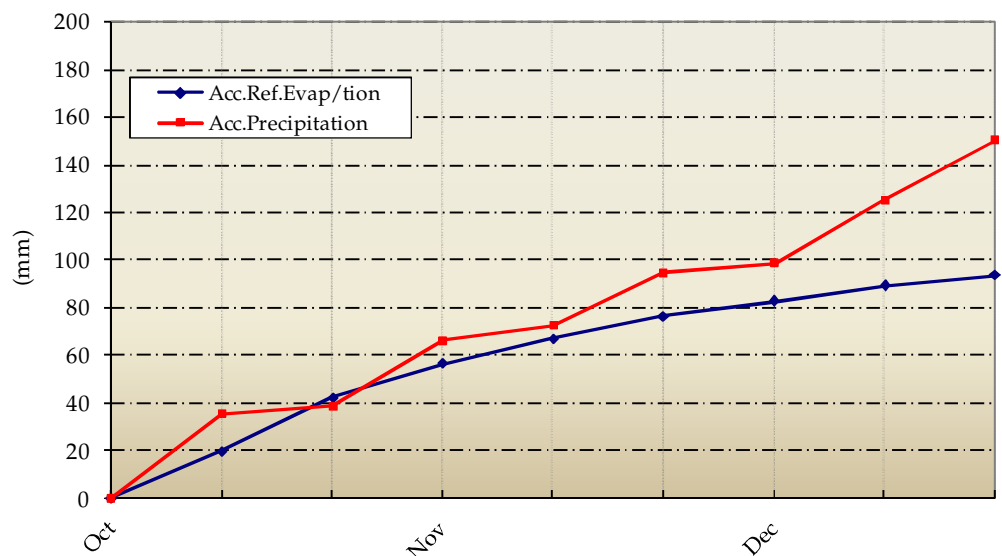


Larisa

2nd 10-day period (11-20/12/2014)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	9.4	13.4	14.3	12.8	8.4	7.8	9.8	8.2	6.6	5.6	9.6	11.5	11.0
	Min	7.8	8.7	1.8	3.0	1.2	6.6	7.4	6.2	5.0	3.4	5.1	-1.2	1.7
Relative Humidity	Max	100	100	100	100	100	100	100	100	100	100	100	87	-
	Min	97	57	55	64	61	87	99	99	98	100	82	36	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	6.9
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	7.3
Sunshine Duration		0.0	0.8	6.9	3.8	0.0	0.0	0.0	0.0	0.0	0.0	1.2	5.8	3.1
Precipitation		2.0					0.6	22.4				25.0	0.0	14.0
Evaporation		0.0	0.3	0.2	1.8	0.3	0.2	0.1	0.0	0.1	0.0	3.0	14.1	6.0
Growing Degrees	5	3.6	6.1	3.1	2.9	0.0	2.2	3.6	2.2	0.8	0.0	24.4	8.4	20.8
	10	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.0	2.1

2nd 10-day period (11-20/12/2014)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	4.6	6.4	5.8
Precipitation - Reference Evapotranspiration	20.4	-6.4	8.2
Number of Rainy Days	3.0	0.0	3.3
Number of Dry Days	1.0	13.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

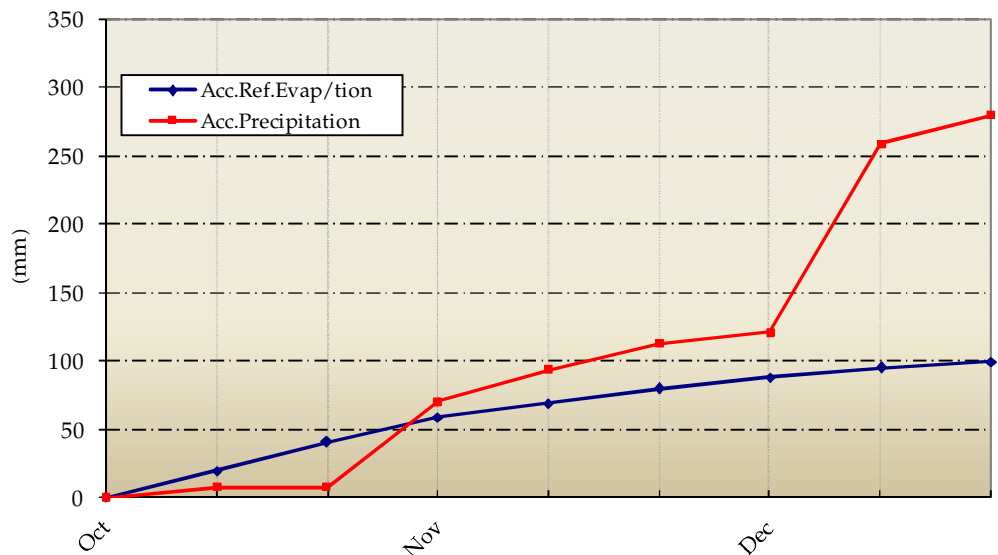


Mikra

2nd 10-day period (11-20/12/2014)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	10.0	13.1	12.3	12.9	8.4	8.8	11.2	10.9	14.2	13.2	11.5	10.4	10.6
	Min	8.6	7.7	5.2	7.2	2.0	4.3	8.4	7.5	3.3	2.0	5.6	-1.4	3.0
Relative Humidity	Max	93	92	93	94	96	94	95	96	97	95	94	84	-
	Min	70	58	68	63	88	87	93	90	56	62	74	40	-
Soil Temperature at 10 cm	06 UTC	10.2	10.6	9.2	9.6	8.4	8.2	9.8	10.4	9.4	7.6	9.3	4.8	6.2
	12 UTC	10.6	11.0	10.8	11.2	9.8	9.2	10.6	10.9	10.4	9.6	10.4	6.6	7.7
Sunshine Duration		0.0	7.0	6.8	5.3	0.7	0.0	0.0	1.4	7.6	8.2	3.7	6.2	2.8
Precipitation		0.6					0.0	20.7				21.3		12.5
Evaporation		2.1	13.5	4.5	0.2	1.3	0.4	0.1	0.1	0.9	0.4	23.5	8.1	10.6
Growing Degrees	5	4.3	5.4	3.8	5.1	0.2	1.6	4.8	4.2	3.8	2.6	35.6	2.2	24.9
	10	0.0	0.4	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	2.8

2nd 10-day period (11-20/12/2014)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	4.9	9.2	8.4
Precipitation - Reference Evapotranspiration	16.4	-9.2	4.1
Number of Rainy Days	2.0	0.0	2.9
Number of Dry Days	0.0	17.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



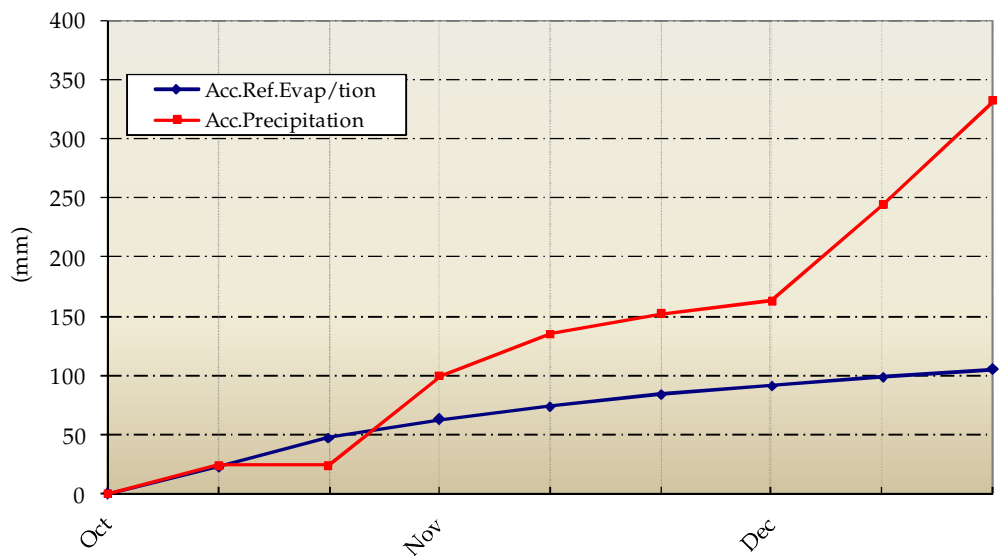


Tanagra

2nd 10-day period (11-20/12/2014)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	12.1	12.5	13.7	14.8	12.4	14.0	16.2	13.8	14.8	16.3	14.1	10.0	13.4
	Min	9.2	10.3	7.8	2.6	1.8	3.5	12.0	4.7	4.2	2.0	5.8	3.4	5.0
Relative Humidity	Max	100	100	100	100	100	100	100	100	100	100	100	90	-
	Min	64	72	62	58	65	76	66	68	62	58	65	60	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
Sunshine Duration		0.0	0.0	4.5	7.4	1.4	0.9	0.5	0.6	6.6	7.1	2.9	-	-
Precipitation		16.2	69.2					2.3				87.7	19.9	25.9
Evaporation		0.4	1.8	1.2	1.2	1.2	2.1	1.7	0.6	1.0	1.0	12.2	-	-
Growing Degrees	5	5.7	6.4	5.8	3.7	2.1	3.8	9.1	4.3	4.5	4.2	49.4	-	-
	10	0.7	1.4	0.8	0.0	0.0	0.0	4.1	0.0	0.0	0.0	6.9	-	-

2nd 10-day period (11-20/12/2014)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	6.8	-	
Precipitation - Reference Evapotranspiration	80.9	-	25.9
Number of Rainy Days	3.0	-	4.3
Number of Dry Days	0.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

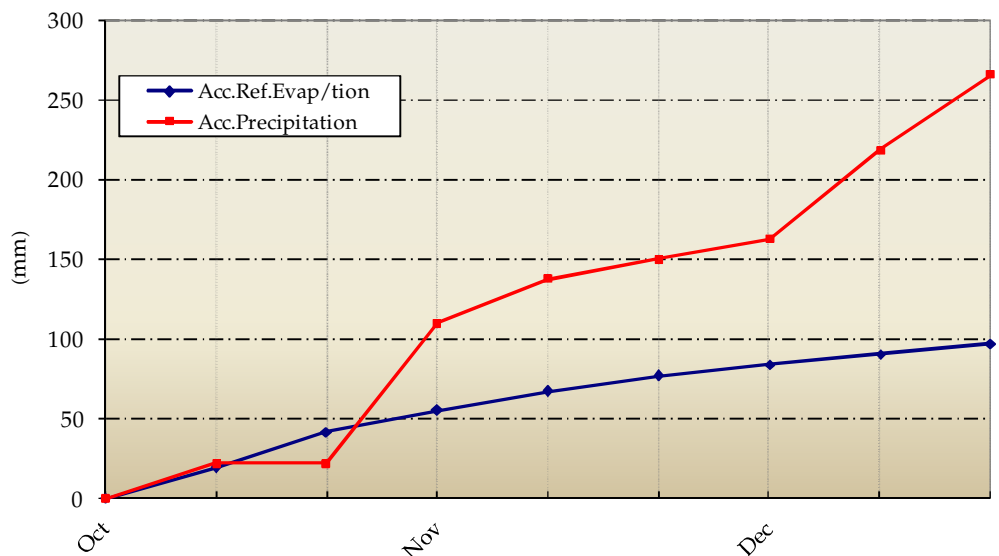


Tripoli

2nd 10-day period (11-20/12/2014)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	11.3	11.5	15.3	14.7	14.0	8.2	10.2	10.6	13.4	14.0	12.3	10.3	10.8
	Min	7.0	6.9	1.5	-1.9	-2.0	0.0	4.5	2.0	-0.4	-2.5	1.5	-2.0	1.8
Relative Humidity	Max	100	100	100	100	100	100	100	100	100	100	100	90	-
	Min	77	65	36	51	52	99	86	76	46	51	64	54	-
Soil Temperature at 10 cm	06 UTC	8.8	8.8	7.8	6.2	5.4	5.8	8.4	6.6	5.6	4.6	6.8	3.5	6.0
	12 UTC	10.2	9.6	-	-	7.4	7.4	9.4	7.4	7.4	-	8.4	5.5	6.7
Sunshine Duration		0.0	1.0	7.3	7.0	4.4	0.0	0.0	3.6	4.2	7.1	3.5	4.9	3.6
Precipitation		8.1	6.6				0.9	18.9	13.0			47.5	0.6	40.9
Evaporation		0.3	1.1	0.3	0.8	0.1	0.2	0.1	2.7	0.0	0.0	5.6	1.8	10.0
Growing Degrees	5	4.2	4.2	3.4	1.4	1.0	0.0	2.4	1.3	1.5	0.8	20.1	0.9	19.6
	10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5

2nd 10-day period (11-20/12/2014)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	6.1	7.6	7.6
Precipitation - Reference Evapotranspiration	41.4	-7.0	33.3
Number of Rainy Days	5.0	1.0	4.3
Number of Dry Days	0.0	3.0	-

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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