



AGROMETEOROLOGICAL BULLETIN

*December 2015
1st 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



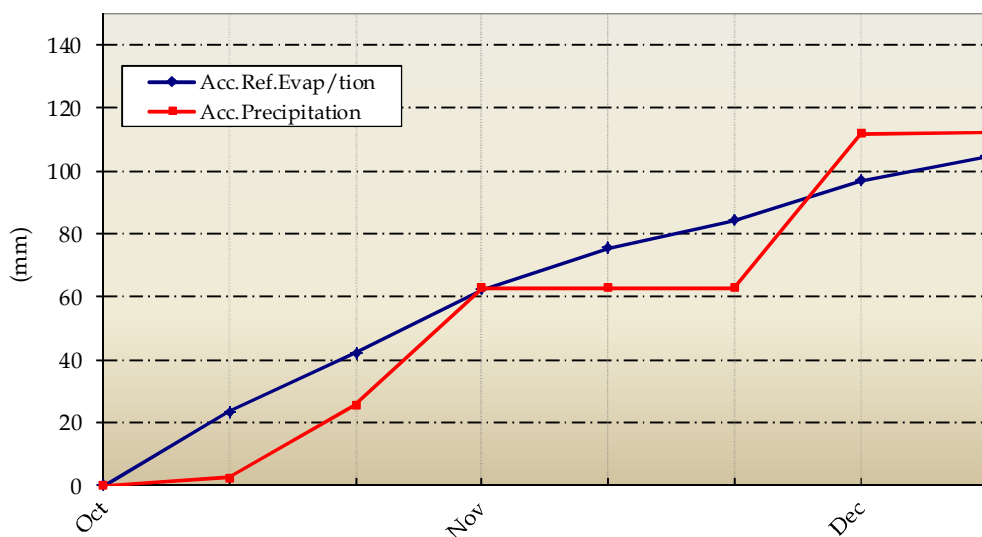
Hellenic National Meteorological Service
 Division of Climatology-Applications
 El. Venizelou Street 14, 16777
 Helliniko, Athens

Web addresses of HNMS
www.hnms.gr
www.emy.gov.gr
www.meteo.gov.gr
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1st 10-day period (1-10/12/2015)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	16.0	15.0	10.8	13.0	12.6	13.6	10.6	13.6	12.4	11.0	12.9	12.4	11.0
	Min	3.4	7.2	7.6	6.8	1.0	0.4	-0.2	1.0	9.2	7.8	4.4	9.2	3.3
Relative Humidity	Max	87	90	91	96	92	96	97	93	76	77	90	95	-
	Min	60	42	60	57	54	63	80	54	54	58	58	82	-
Soil Temperature at 10 cm	06 UTC	6.8	9.5	10.2	9.6	7.4	6.1	6.0	6.4	9.0	9.4	8.0	10.5	7.1
	12 UTC	11.2	12.0	10.8	11.2	10.2	9.2	8.4	9.0	10.4	10.0	10.2	11.5	8.4
Sunshine Duration		4.0	5.9	0.7	1.3	7.7	6.7	7.6	7.3	2.0	0.0	4.3	0.3	2.7
Precipitation				0.5							0.1	0.6	153.1	30.2
Evaporation		0.8	1.9	1.1	0.9	1.5	0.5	0.6	2.8	3.6	2.2	15.9	7.2	14.9
Growing Degrees	5	4.7	6.1	4.2	4.9	1.8	2.0	0.2	2.3	5.8	4.4	36.4	58.2	28.2
	10	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.0	1.9	12.6	5.3

1st 10-day period (1-10/12/2015)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	7.7	6.7	9.7
Precipitation - Reference Evapotranspiration	-7.1	146.4	20.5
Number of Rainy Days	2.0	8.0	3.2
Number of Dry Days	4.0	1.0	-

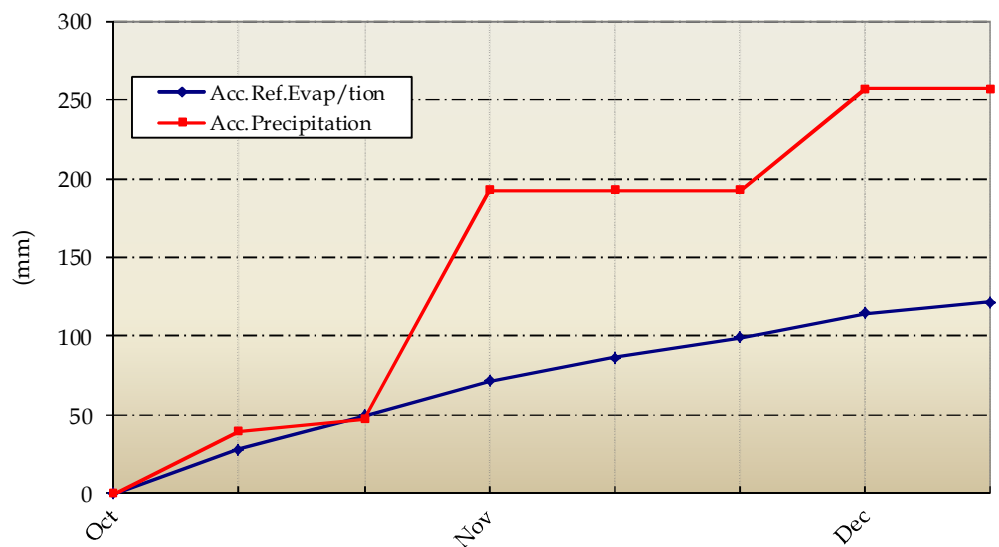
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



1st 10-day period (1-10/12/2015)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	18.0	17.6	19.8	19.6	18.3	17.2	17.1	17.0	17.0	16.4	17.8	19.1	15.9
	Min	4.7	6.2	6.5	11.8	5.0	4.2	4.6	4.0	3.0	4.4	5.4	11.9	7.3
Relative Humidity	Max	89	91	91	92	92	89	91	92	92	89	91	90	-
	Min	52	60	47	60	44	56	63	54	45	49	53	59	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	14.3	10.4
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	16.2	12.0
Sunshine Duration		6.0	7.4	7.7	4.7	7.8	7.7	7.8	8.3	7.5	6.6	7.2	3.1	4.3
Precipitation													112.7	41.8
Evaporation		4.0	1.0	3.0	0.4	2.6	0.6	1.0	1.4	1.0	0.0	15.0	-	19.4
Growing Degrees	5	6.4	6.9	8.2	10.7	6.7	5.7	5.9	5.5	5.0	5.4	66.2	105.1	66.0
	10	1.4	1.9	3.2	5.7	1.7	0.7	0.9	0.5	0.0	0.4	16.2	55.1	20.7

1st 10-day period (1-10/12/2015)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	7.4	11.4	9.1
Precipitation - Reference Evapotranspiration	-7.4	101.3	32.7
Number of Rainy Days	0.0	8.0	4.6
Number of Dry Days	12.0	4.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

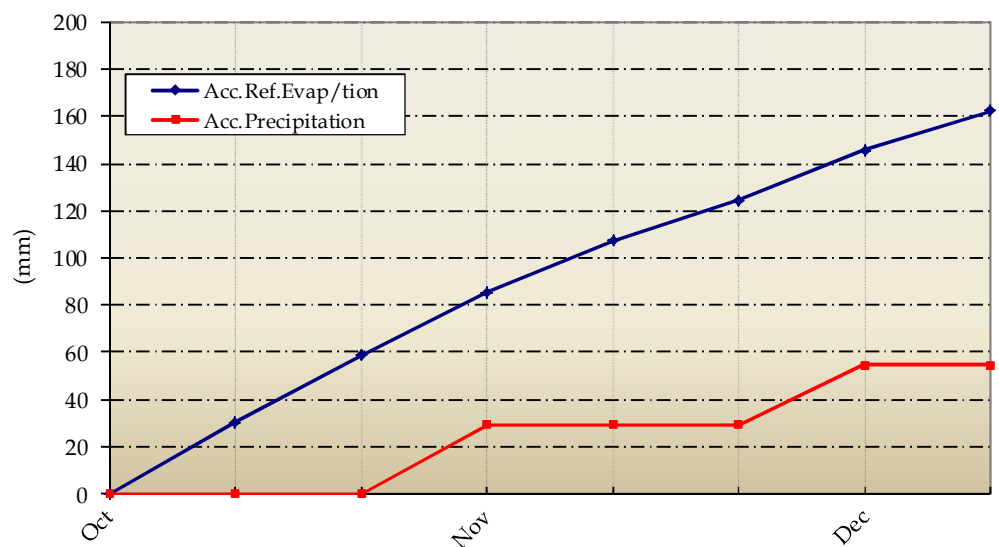


Iraklio

1st 10-day period (1-10/12/2015)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	18.8	19.4	18.0	16.8	16.2	17.0	17.0	17.4	16.8	15.4	17.3	21.0	17.3
	Min	11.2	13.0	11.0	14.0	13.8	10.6	13.8	13.0	15.2	15.0	13.1	14.6	11.5
Relative Humidity	Max	79	85	77	77	79	82	78	77	73	70	78	87	-
	Min	53	61	58	50	56	57	62	57	59	58	57	56	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
Sunshine Duration		8.2	7.2	4.9	7.6	5.5	6.7	3.7	4.2	0.1	0.0	4.8	4.0	3.5
Precipitation													29.4	24.2
Evaporation		0.6	1.7	1.8	3.0	2.0	1.9	2.9	1.3	3.5	1.7	20.4	14.1	28.3
Growing Degrees	5	10.0	11.2	9.5	10.4	10.0	8.8	10.4	10.2	11.0	10.2	101.7	128.0	94.2
	10	5.0	6.2	4.5	5.4	5.0	3.8	5.4	5.2	6.0	5.2	51.7	78.0	44.6

1st 10-day period (1-10/12/2015)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	16.7	17.3	-
Precipitation - Reference Evapotranspiration	-16.7	12.1	24.2
Number of Rainy Days	0.0	4.0	3.7
Number of Dry Days	10.0	6.0	-

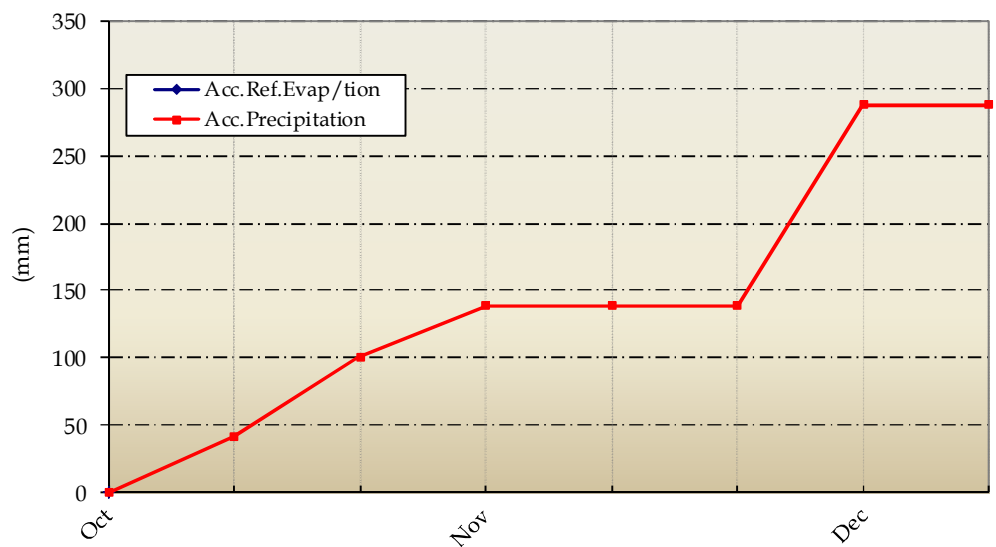
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



1st 10-day period (1-10/12/2015)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	13.4	15.7	16.7	16.3	11.2	13.1	9.3	8.0	7.9	9.7	12.1	14.4	10.3
	Min	-1.7	-1.4	-0.8	-1.7	-1.1	-1.1	-0.5	-1.3	-1.2	-2.3	-1.3	6.6	1.9
Relative Humidity	Max	100	100	100	100	100	100	100	100	100	100	100	100	-
	Min	49	53	-	49	-	65	89	96	90	73	70	71	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	5.5
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	6.5
Sunshine Duration		3.4	4.3	-	4.9	-	3.1	1.1	0.7	1.4	-	2.7	2.4	2.5
Precipitation		0.0	0.0						0.0			0.0	159.6	51.5
Evaporation		-	-	-	-	-	-	-	-	-	-	-	-	10.5
Growing Degrees	5	0.9	2.2	3.0	2.3	0.1	1.0	0.0	0.0	0.0	0.0	9.3	54.9	17.8
	10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13.2	0.9

1st 10-day period (1-10/12/2015)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	-	5.2	6.1
Precipitation - Reference Evapotranspiration	-	154.4	45.4
Number of Rainy Days	0.0	7.0	4.2
Number of Dry Days	11.0	1.0	-

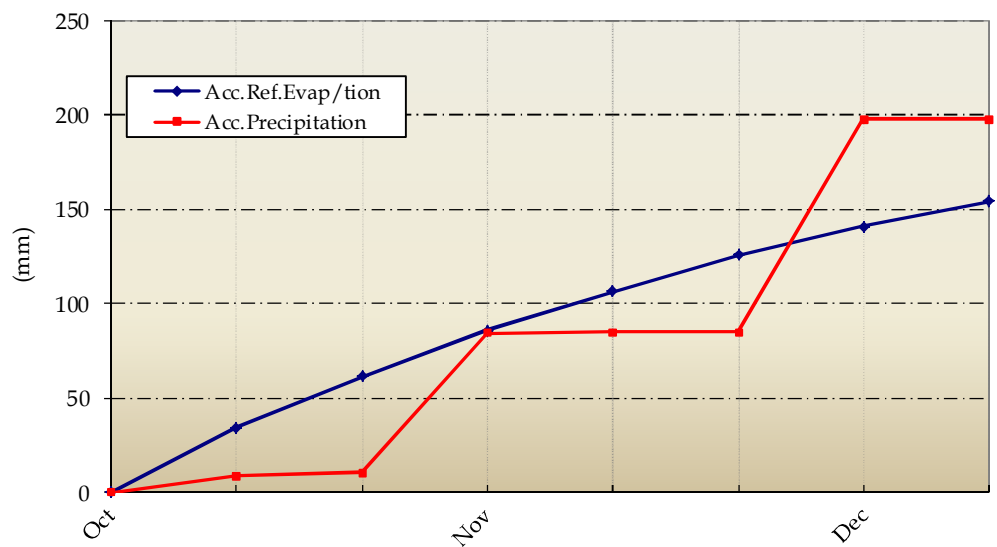
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



1st 10-day period (1-10/12/2015)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	19.3	21.3	20.6	18.5	19.9	20.6	19.8	19.0	19.2	18.6	19.7	19.2	16.9
	Min	3.4	7.1	5.2	8.9	6.1	5.6	5.6	4.6	4.2	3.8	5.4	10.7	7.2
Relative Humidity	Max	92	93	92	92	89	90	91	93	92	93	92	93	-
	Min	41	36	47	57	32	34	36	45	34	38	40	60	-
Soil Temperature at 10 cm	06 UTC	11.8	13.2	13.0	14.0	12.4	13.0	12.0	12.0	12.0	11.2	12.5	14.8	11.5
	12 UTC	13.2	14.0	14.0	14.0	14.0	14.0	13.4	13.4	13.6	13.6	13.7	15.2	12.5
Sunshine Duration		8.6	7.3	8.5	2.8	8.3	7.5	8.2	8.1	8.7	6.7	7.5	3.6	4.0
Precipitation													105.0	45.8
Evaporation		2.2	0.8	1.0	1.0	1.0	1.9	1.5	1.4	1.8	1.1	13.7	-	26.7
Growing Degrees	5	6.4	9.2	7.9	8.7	8.0	8.1	7.7	6.8	6.7	6.2	75.7	99.7	70.4
	10	1.4	4.2	2.9	3.7	3.0	3.1	2.7	1.8	1.7	1.2	25.7	49.7	22.7

1st 10-day period (1-10/12/2015)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	13.2	13.1	10.9
Precipitation - Reference Evapotranspiration	-13.2	91.9	34.9
Number of Rainy Days	0.0	7.0	4.7
Number of Dry Days	11.0	3.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

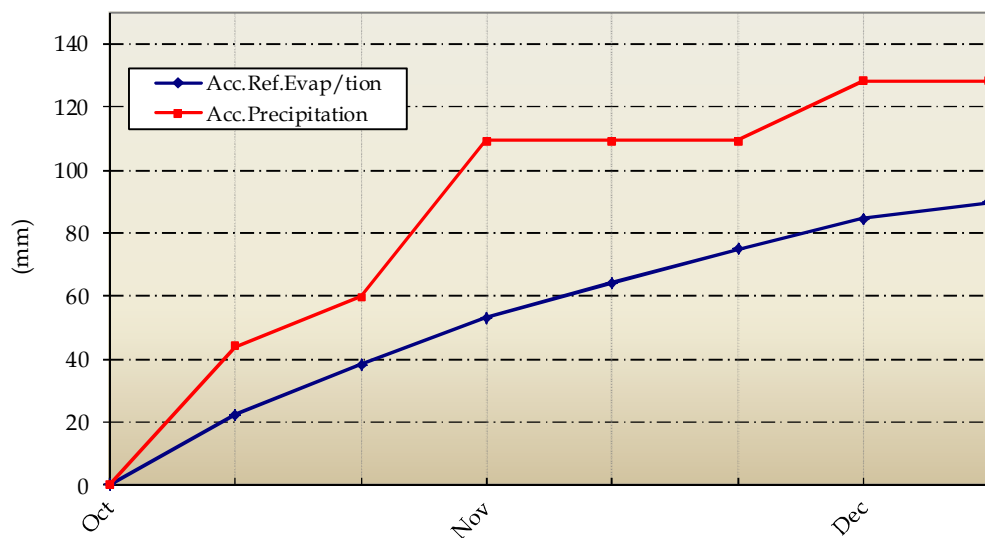


Larisa

1st 10-day period (1-10/12/2015)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	13.6	16.2	17.0	15.8	15.3	14.4	7.9	8.0	13.2	10.2	13.2	15.2	11.5
	Min	0.4	2.2	2.5	2.0	4.6	0.5	1.2	1.8	-0.6	3.6	1.8	10.3	2.7
Relative Humidity	Max	100	100	100	100	100	100	100	100	100	100	100	100	-
	Min	59	47	45	59	61	61	99	98	67	65	66	83	-
Soil Temperature at 10 cm	06 UTC	11.8	11.8	11.2	11.4	11.2	10.8	10.6	10.4	10.4	10.2	11.0	-	8.1
	12 UTC	11.4	11.4	11.2	15.4	11.2	11.2	10.4	10.0	10.2	10.0	11.2	-	8.8
Sunshine Duration		3.4	6.9	7.0	7.5	6.6	4.9	1.1	2.0	6.0	0.0	4.5	1.0	2.9
Precipitation													26.7	18.5
Evaporation		1.0	0.4	1.2	0.3	2.0	0.5	0.2	0.2	0.4	0.4	6.6	10.0	7.8
Growing Degrees	5	2.0	4.2	4.8	3.9	5.0	2.5	0.0	0.0	1.3	1.9	25.5	77.6	25.6
	10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	27.6	2.3

1st 10-day period (1-10/12/2015)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	5.3	6.4	6.7
Precipitation - Reference Evapotranspiration	-5.3	20.3	11.8
Number of Rainy Days	0.0	8.0	3.6
Number of Dry Days	12.0	0.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

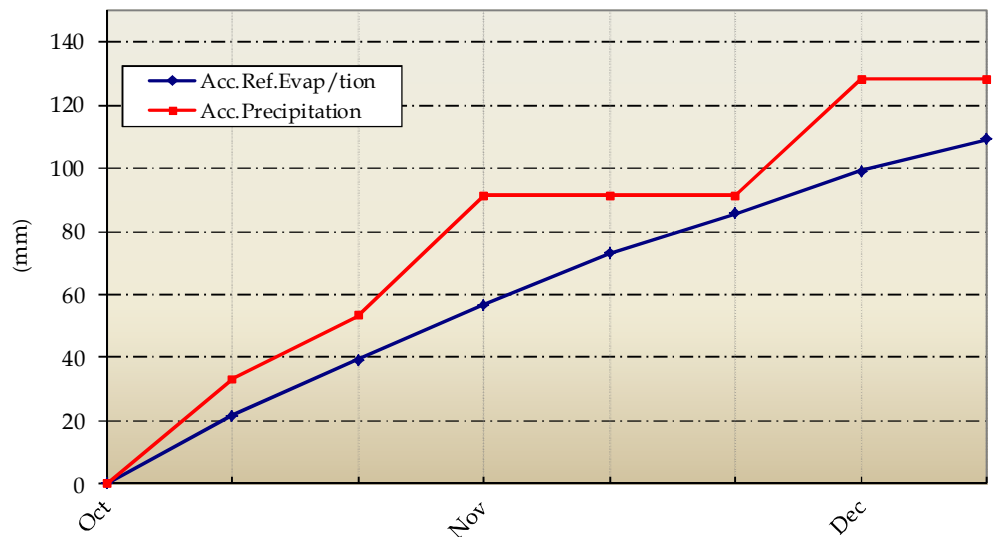


Mikra

1st 10-day period (1-10/12/2015)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	13.4	17.2	18.0	15.0	15.2	13.8	15.2	13.0	13.0	9.7	14.4	13.8	11.5
	Min	3.2	10.5	10.0	6.5	8.0	4.8	1.8	1.7	3.0	6.4	5.6	10.8	3.4
Relative Humidity	Max	88	68	94	94	94	97	97	94	97	89	91	94	-
	Min	49	44	45	67	63	63	49	57	62	54	55	80	-
Soil Temperature at 10 cm	06 UTC	8.2	9.8	10.8	11.0	11.0	10.2	8.8	8.0	8.0	9.2	9.5	12.7	7.3
	12 UTC	10.0	11.2	12.4	12.0	10.2	11.8	10.2	10.0	9.8	9.5	10.7	13.4	8.9
Sunshine Duration		2.0	6.7	8.2	5.9	6.2	5.0	5.9	8.2	5.4	0.0	5.4	0.7	3.1
Precipitation													137.9	19.0
Evaporation		0.5	0.5	4.9	0.7	0.8	0.4	0.1	0.8	3.3	2.1	14.1	4.2	13.0
Growing Degrees	5	3.3	8.9	9.0	5.8	6.6	4.3	3.5	2.4	3.0	3.1	49.7	73.1	28.1
	10	0.0	3.9	4.0	0.8	1.6	0.0	0.0	0.0	0.0	0.0	10.2	26.0	3.2

1st 10-day period (1-10/12/2015)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	10.0	7.0	8.7
Precipitation - Reference Evapotranspiration	-10.0	130.9	10.3
Number of Rainy Days	0.0	10.0	3.0
Number of Dry Days	13.0	0.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

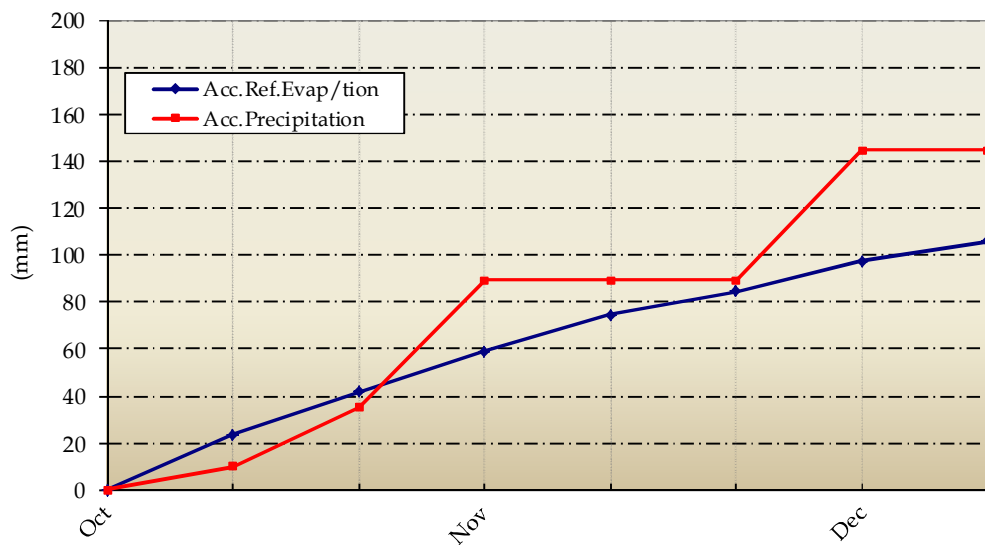


Tanagra

1st 10-day period (1-10/12/2015)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	18.4	18.8	16.8	16.2	14.1	16.4	15.4	14.6	14.4	11.7	15.7	17.0	14.0
	Min	3.0	6.4	7.4	5.0	4.1	2.9	3.9	2.3	7.0	9.4	5.1	10.1	5.7
Relative Humidity	Max	99	91	100	100	100	100	100	100	92	81	96	100	-
	Min	31	36	50	55	58	53	59	58	54	67	52	68	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
Sunshine Duration		6.4	7.1	7.8	6.3	1.2	6.7	6.8	6.9	1.6	0.0	5.1	2.2	
Precipitation											0.0	0.0	81.1	28.6
Evaporation		3.0	2.5	2.0	2.0	2.5	1.4	0.5	2.4	3.6	1.0	20.9	13.0	
Growing Degrees	5	5.7	7.6	7.1	5.6	4.1	4.7	4.7	3.5	5.7	5.6	54.1	85.8	
	10	0.7	2.6	2.1	0.6	0.0	0.0	0.0	0.0	0.7	0.6	7.3	37.3	

1st 10-day period (1-10/12/2015)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	8.5	7.2	
Precipitation - Reference Evapotranspiration	-8.5	73.9	28.6
Number of Rainy Days	0.0	6.0	4.4
Number of Dry Days	12.0	2.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

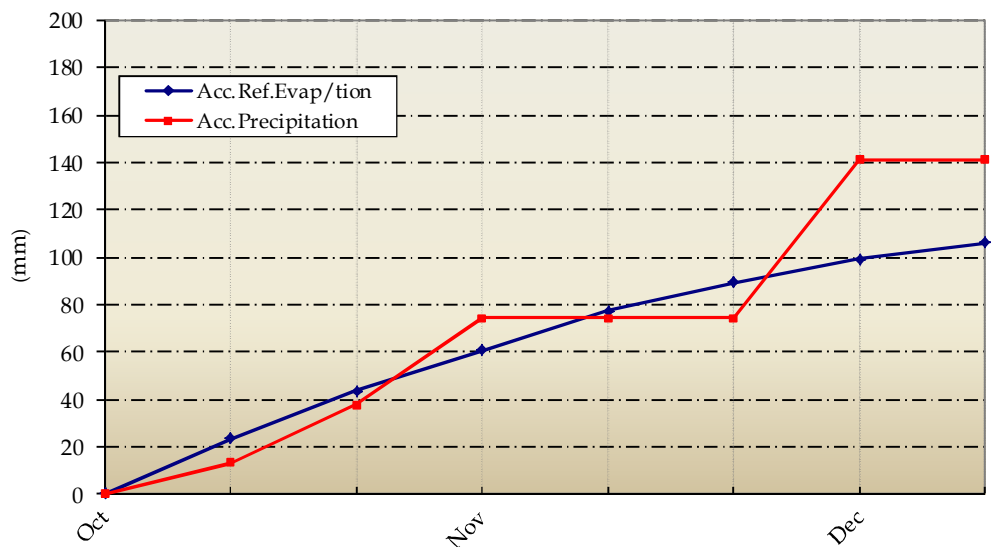


Tripoli

1st 10-day period (1-10/12/2015)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	16.2	19.1	14.9	13.4	13.0	15.6	17.2	16.7	13.8	11.4	15.1	15.0	11.6
	Min	-2.5	0.2	-0.9	0.2	-0.6	-2.0	-3.4	-3.6	-4.4	-1.1	-1.8	5.8	2.8
Relative Humidity	Max	100	100	100	100	100	100	100	100	100	100	100	100	-
	Min	32	27	47	66	51	42	26	23	46	52	41	63	-
Soil Temperature at 10 cm	06 UTC	6.0	6.4	6.2	6.4	6.4	5.4	4.6	4.2	3.6	4.8	5.4	9.9	7.1
	12 UTC	8.4	8.8	8.8	9.4	-	-	7.6	7.2	6.6	7.8	8.1	11.4	7.9
Sunshine Duration		7.7	7.4	7.4	3.9	7.8	6.1	7.1	6.9	6.8	5.4	6.6	3.2	3.7
Precipitation													56.2	38.8
Evaporation		0.4	0.4	0.7	0.8	0.5	0.0	0.2	0.0	0.0	1.3	4.3	7.2	9.1
Growing Degrees	5	1.9	4.7	2.0	1.8	1.2	1.8	1.9	1.6	0.0	0.2	16.9	54.0	26.1
	10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.6	2.6

1st 10-day period (1-10/12/2015)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	6.8	6.8	8.4
Precipitation - Reference Evapotranspiration	-6.8	49.4	30.4
Number of Rainy Days	0.0	7.0	4.3
Number of Dry Days	12.0	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_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

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