



AGROMETEOROLOGICAL BULLETIN

November 2014
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



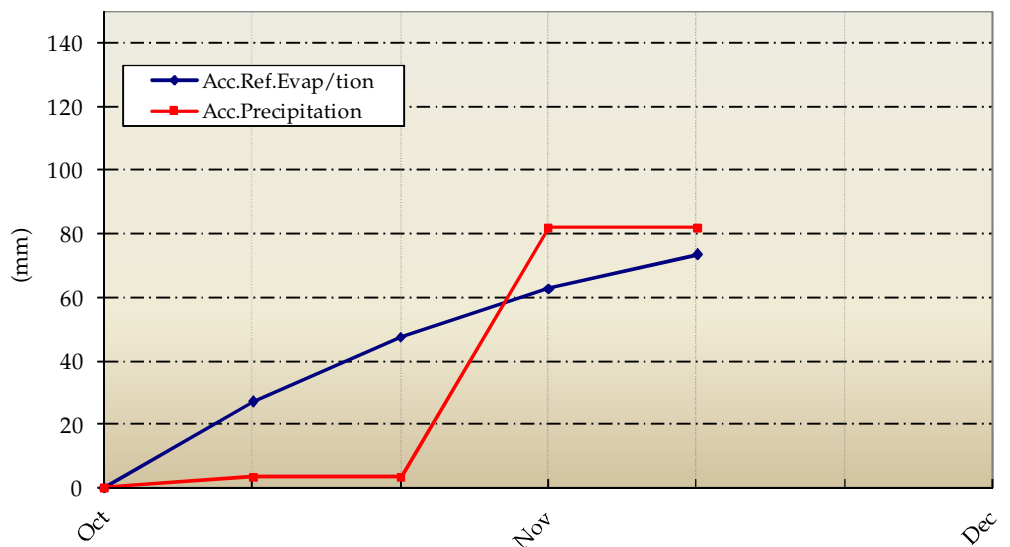
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www.hnms.gr
www.emy.gov.gr
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1st 10-day period (1-10/11/2014)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	13.6	14.0	13.4	14.8	14.6	18.0	18.8	21.2	18.0	18.4	16.5	19.1	15.8
	Min	6.0	4.2	5.0	0.6	1.0	9.6	9.8	11.0	11.6	13.0	7.2	10.0	7.1
Relative Humidity	Max	88	83	87	91	92	93	98	97	89	96	91	92	-
	Min	55	49	45	45	67	73	80	55	53	75	60	62	-
Soil Temperature at 10 cm	06 UTC	9.2	8.6	8.6	7.2	7.2	11.2	12.0	12.6	12.4	14.2	10.3	14.6	11.0
	12 UTC	12.0	12.2	12.2	11.6	11.8	13.8	14.2	15.0	14.6	15.8	13.3	16.5	12.9
Sunshine Duration		7.0	7.8	7.0	9.3	8.7	2.3	1.8	1.7	1.6	1.5	4.9	5.2	4.1
Precipitation										0.1		0.1	18.9	19.0
Evaporation		2.9	1.5	1.0	1.0	1.0	1.7	1.9	2.7	0.9	2.7	17.3	21.9	25.4
Growing Degrees	5	4.8	4.1	4.2	2.7	2.8	8.8	9.3	11.1	9.8	10.7	68.3	95.5	64.9
	10	0.0	0.0	0.0	0.0	0.0	3.8	4.3	6.1	4.8	5.7	24.7	45.5	23.3

1st 10-day period (1-10/11/2014)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	10.5	13.4	14.9
Precipitation - Reference Evapotranspiration	-10.4	5.5	4.1
Number of Rainy Days	1.0	3.0	1.9
Number of Dry Days	8.0	17.0	-

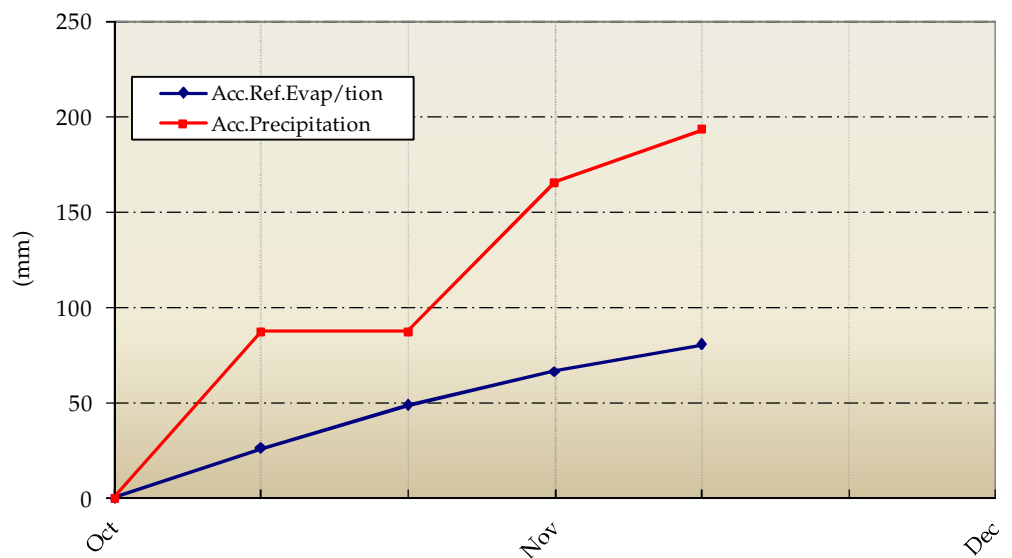
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



1st 10-day period (1-10/11/2014)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	19.4	19.4	20.6	20.2	20.9	24.6	21.8	22.1	20.6	21.5	21.1	23.0	20.0
	Min	7.3	5.8	6.2	9.7	12.6	11.0	13.0	11.3	8.9	9.0	9.5	12.8	10.4
Relative Humidity	Max	93	90	89	82	91	91	91	90	92	92	90	89	-
	Min	36	33	43	49	45	49	61	46	54	56	47	52	-
Soil Temperature at 10 cm	06 UTC	14.4	14.0	13.8	14.4	15.4	14.2	15.2	15.8	14.8	14.6	14.7	16.5	14.3
	12 UTC	18.0	16.8	17.0	17.4	16.4	17.6	18.2	18.2	16.6	17.4	17.4	19.9	16.6
Sunshine Duration		8.8	9.0	8.9	7.1	1.7	3.5	0.0	3.5	8.5	8.8	6.0	7.0	6.0
Precipitation						1.0		16.0	10.7			27.7	42.3	45.1
Evaporation		4.0	2.0	2.0	1.2	0.8	1.2	0.6	1.1	1.0	1.4	15.3	45.1	25.9
Growing Degrees	5	8.4	7.6	8.4	10.0	11.8	12.8	12.4	11.7	9.8	10.3	103.0	128.8	101.6
	10	3.4	2.6	3.4	5.0	6.8	7.8	7.4	6.7	4.8	5.3	53.0	78.8	52.1

1st 10-day period (1-10/11/2014)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	13.9	17.4	14.3
Precipitation - Reference Evapotranspiration	13.8	24.9	30.8
Number of Rainy Days	3.0	3.0	3.2
Number of Dry Days	4.0	18.0	-

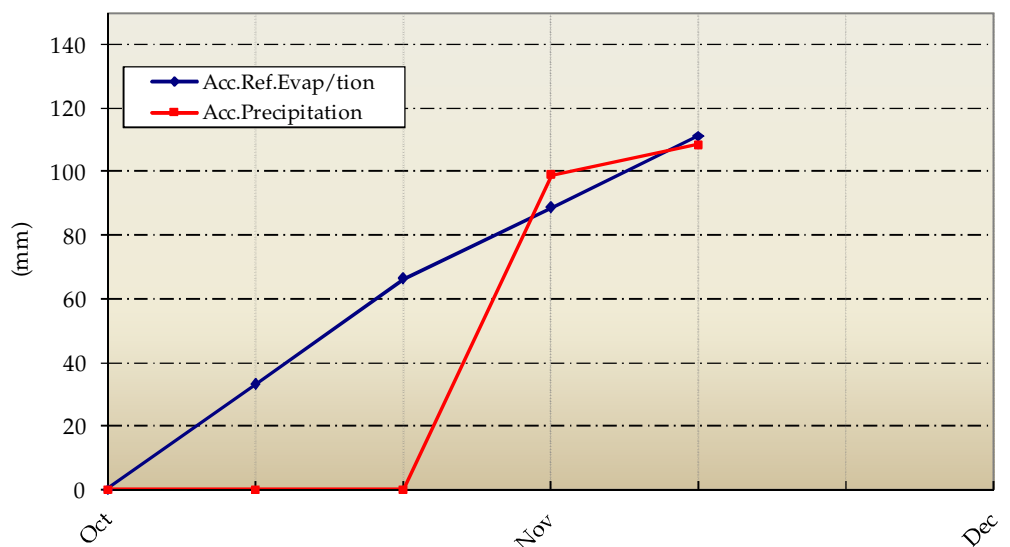
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



1st 10-day period (1-10/11/2014)		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	19.0	19.0	19.6	19.8	25.2	24.4	24.8	24.0	22.4	21.6	22.9	20.4
	Min	14.4	16.4	15.6	15.0	12.0	15.6	17.2	17.6	14.8	17.6	15.6	16.5	14.3
Relative Humidity	Max	83	77	75	88	86	81	86	90	85	94	84	85	-
	Min	64	61	60	64	63	53	52	51	52	73	59	59	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
Sunshine Duration		0.0	1.6	1.8	5.3	6.9	6.4	4.1	7.1	5.4	9.5	4.8	6.2	5.0
Precipitation		1.8	1.2						0.8	5.8		9.6	20.2	20.0
Evaporation		0.2	3.1	3.6	3.9	1.2	1.4	3.4	3.9	2.2	0.9	23.8	24.7	39.9
Growing Degrees	5	11.2	12.7	12.3	12.3	10.9	15.4	15.8	16.2	14.4	15.0	136.2	146.8	123.4
	10	6.2	7.7	7.3	7.3	5.9	10.4	10.8	11.2	9.4	10.0	86.2	96.8	73.4

1st 10-day period (1-10/11/2014)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	22.7	23.1	-
Precipitation - Reference Evapotranspiration	-13.1	-2.9	20.0
Number of Rainy Days	4.0	2.0	2.6
Number of Dry Days	0.0	19.0	-

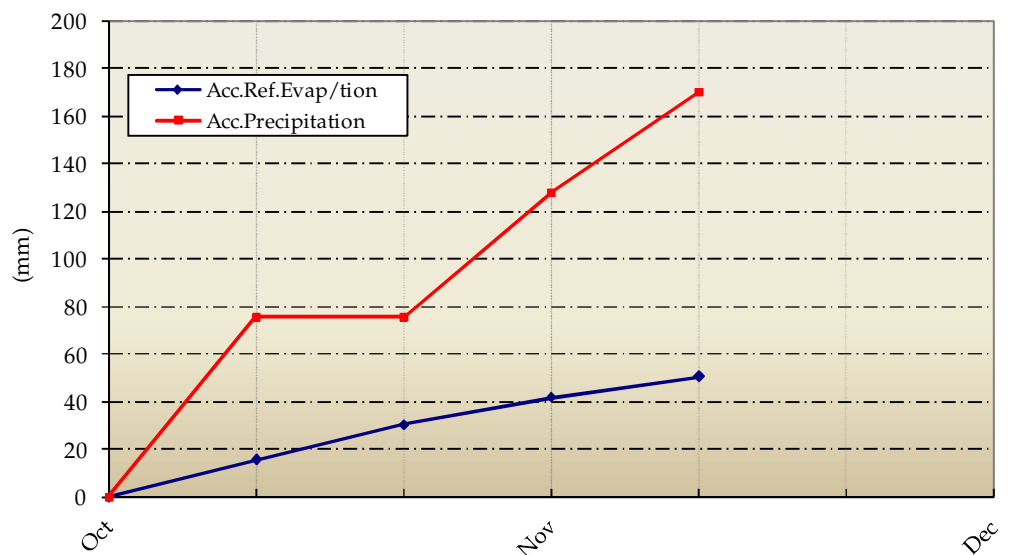
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



1st 10-day period (1-10/11/2014)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	17.3	17.5	17.0	17.2	18.5	20.0	18.3	20.9	18.2	18.6	18.4	20.2	16.0
	Min	7.9	-1.4	-0.1	0.2	5.0	8.6	12.6	6.8	4.3	5.7	5.0	5.7	5.4
Relative Humidity	Max	78	100	100	100	100	99	95	100	99	100	97	99	-
	Min	27	32	49	49	53	48	70	45	60	57	49	42	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	10.0
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	11.8
Sunshine Duration		6.6	4.6	5.6	3.1	5.4	2.2	0.0	3.6	4.2	3.0	3.8	3.6	4.1
Precipitation						0.0	1.5	1.6	39.0			42.1	9.0	40.1
Evaporation		-	-	-	-	-	-	-	-	-	-	-	-	16.8
Growing Degrees	5	7.6	3.1	3.5	3.7	6.8	9.3	10.5	8.9	6.3	7.2	66.6	79.6	57.3
	10	2.6	0.0	0.0	0.0	1.8	4.3	5.5	3.9	1.3	2.2	21.4	29.7	16.4

1st 10-day period (1-10/11/2014)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	8.5	12.4	10.7
Precipitation - Reference Evapotranspiration	33.6	-3.4	29.4
Number of Rainy Days	3.0	3.0	3.4
Number of Dry Days	11.0	2.0	-

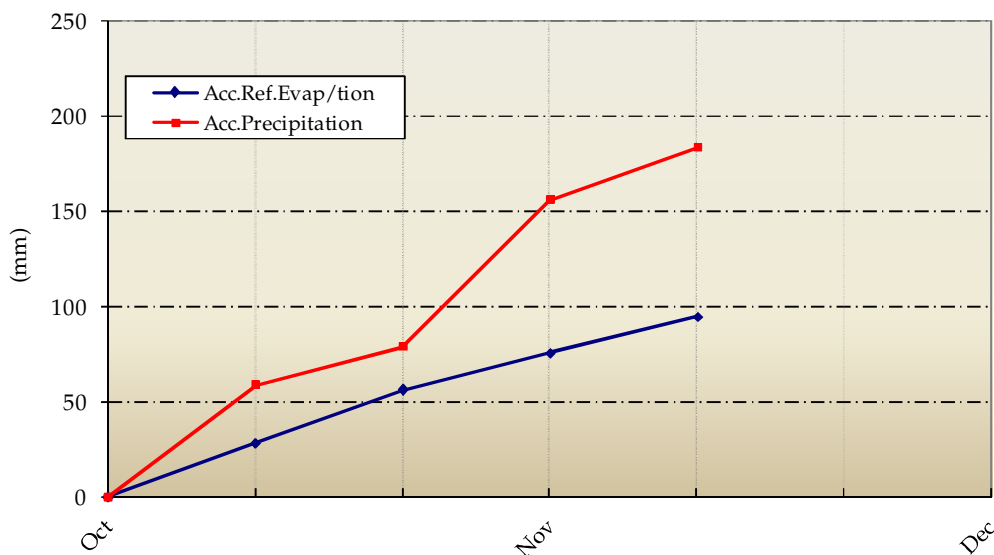
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



1st 10-day period (1-10/11/2014)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	21.4	19.4	21.4	21.6	21.6	23.7	21.9	20.4	24.4	22.3	21.8	23.9	21.0
	Min	11.2	8.7	7.4	7.6	9.1	12.3	13.9	10.8	11.0	10.5	10.2	12.2	10.2
Relative Humidity	Max	66	85	91	94	94	92	94	94	92	94	90	90	-
	Min	37	36	43	35	56	53	59	57	38	50	46	46	-
Soil Temperature at 10 cm	06 UTC	16.4	15.6	15.2	15.4	15.6	16.2	16.8	16.2	16.0	15.8	15.9	-	15.1
	12 UTC	16.8	17.0	16.0	16.2	16.6	16.8	17.4	17.6	16.6	16.6	16.8	-	16.9
Sunshine Duration		8.7	9.2	8.3	7.9	4.7	5.2	0.0	3.4	8.8	8.9	6.5	7.4	5.6
Precipitation						0.2		14.0	13.3			27.5	48.3	35.3
Evaporation		-	-	-	-	-	-	-	-	-	-	-	-	30.4
Growing Degrees	5	11.3	9.1	9.4	9.6	10.4	13.0	12.9	10.6	12.7	11.4	110.3	130.1	105.8
	10	6.3	4.1	4.4	4.6	5.4	8.0	7.9	5.6	7.7	6.4	60.3	80.1	55.9

1st 10-day period (1-10/11/2014)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	18.7	22.4	16.4
Precipitation - Reference Evapotranspiration	8.8	25.9	18.9
Number of Rainy Days	3.0	2.0	3.1
Number of Dry Days	4.0	18.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

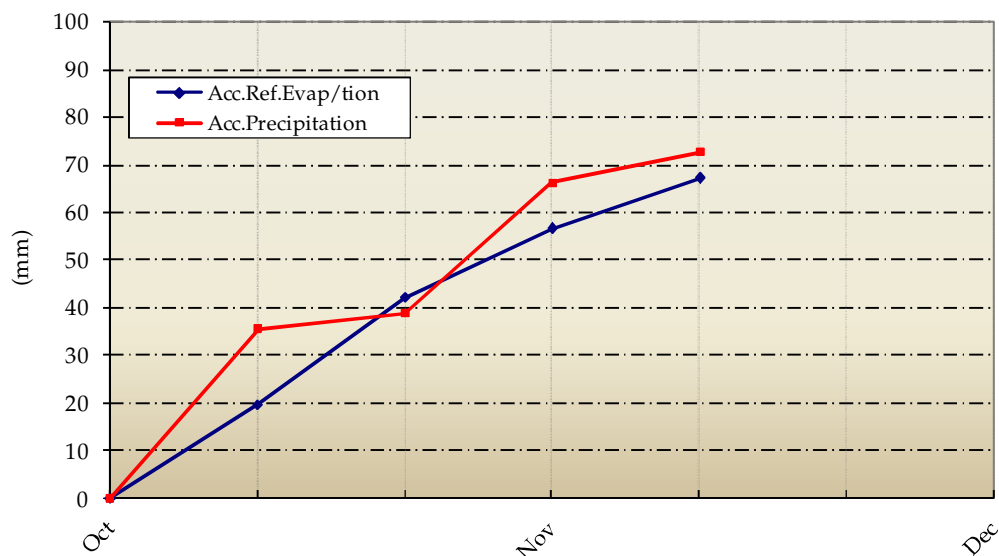


Larisa

1st 10-day period (1-10/11/2014)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	16.6	17.0	15.1	17.5	16.2	18.0	20.0	17.8	19.2	19.6	17.7	23.0	17.2
	Min	8.4	3.3	4.6	6.7	7.0	12.7	13.5	14.2	10.5	8.2	8.9	8.9	6.7
Relative Humidity	Max	99	100	100	100	100	100	100	100	100	100	100	95	-
	Min	39	41	61	48	65	67	68	87	66	65	61	39	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	12.3
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	13.2
Sunshine Duration		6.7	7.0	2.5	4.3	0.0	0.0	2.0	0.0	5.3	5.1	3.3	5.1	4.1
Precipitation							0.0	0.0	6.2			6.2	2.3	20.6
Evaporation		2.8	2.5	2.4	1.3	0.8	0.6	0.0	0.0	4.0	7.0	21.4	26.8	17.6
Growing Degrees	5	7.5	5.2	4.9	7.1	6.6	10.4	11.8	11.0	9.9	8.9	83.1	109.2	69.6
	10	2.5	0.2	0.0	2.1	1.6	5.4	6.8	6.0	4.9	3.9	33.2	59.2	25.7

1st 10-day period (1-10/11/2014)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	10.6	15.7	11.7
Precipitation - Reference Evapotranspiration	-4.4	-13.4	8.9
Number of Rainy Days	1.0	1.0	2.7
Number of Dry Days	12.0	20.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

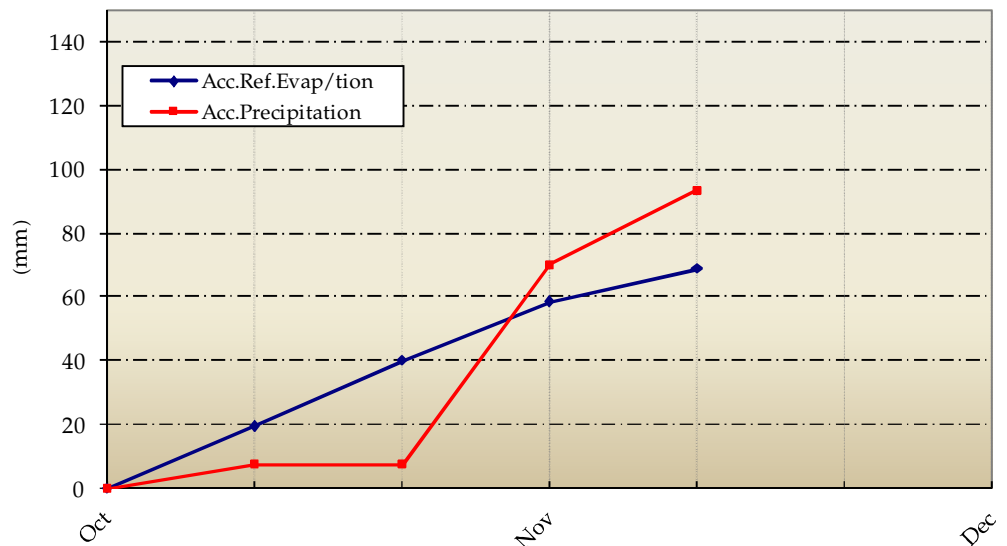


Mikra

1st 10-day period (1-10/11/2014)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	16.4	16.0	15.8	16.8	16.0	16.4	17.7	18.0	17.1	18.1	16.8	20.5	16.5
	Min	4.6	3.3	7.0	11.0	10.0	14.6	14.6	14.4	14.5	9.3	10.3	11.9	7.9
Relative Humidity	Max	93	91	90	86	83	93	93	93	93	93	91	86	-
	Min	40	42	57	55	66	74	79	72	69	65	62	56	-
Soil Temperature at 10 cm	06 UTC	11.6	11.0	11.8	13.4	13.8	15.0	15.4	15.6	15.8	14.2	13.8	16.7	11.5
	12 UTC	14.2	13.6	13.8	15.2	15.2	15.4	17.2	16.6	16.6	16.2	15.4	19.1	13.8
Sunshine Duration		8.5	8.7	2.6	3.1	0.0	0.0	1.0	0.0	0.0	9.1	3.3	4.7	4.0
Precipitation							0.1		20.2	3.0		23.3	1.5	18.1
Evaporation		1.0	1.1	2.5	0.8	0.8	0.5	1.6	1.6	1.0	1.8	12.7	19.9	22.5
Growing Degrees	5	5.5	4.7	6.4	8.9	8.0	10.5	11.2	11.2	10.8	8.7	85.8	112.1	72.4
	10	0.5	0.0	1.4	3.9	3.0	5.5	6.2	6.2	5.8	3.7	36.2	62.1	27.9

1st 10-day period (1-10/11/2014)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	10.4	14.6	13.6
Precipitation - Reference Evapotranspiration	12.9	-13.1	4.5
Number of Rainy Days	3.0	2.0	2.5
Number of Dry Days	5.0	25.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

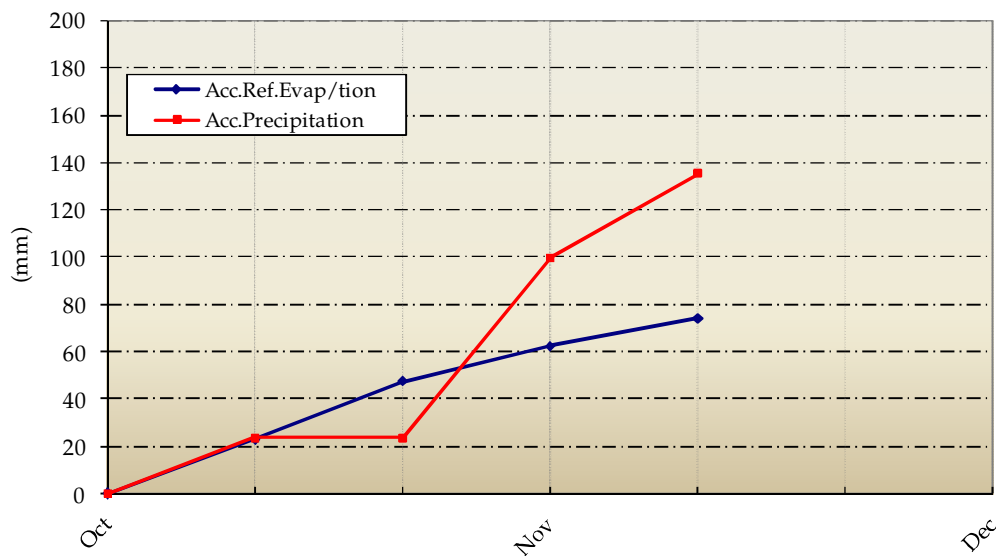


Tanagra

1st 10-day period (1-10/11/2014)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	14.8	14.8	15.6	17.2	17.2	21.3	19.6	15.8	19.2	19.2	17.5	21.3	19.0
	Min	9.4	7.5	7.0	11.0	5.4	12.4	11.3	13.0	11.6	9.7	9.8	10.7	9.1
Relative Humidity	Max	78	95	96	100	100	100	100	100	100	100	97	96	-
	Min	48	57	53	51	67	56	67	97	70	63	63	48	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
Sunshine Duration		5.7	5.4	2.9	7.0	5.0	5.1	6.7	0.0	6.3	4.7	4.9	-	-
Precipitation		0.0							35.6	0.0		35.6	-	19.6
Evaporation		3.0	2.2	2.3	2.0	1.5	1.5	1.6	0.9	0.7	1.0	16.7	-	-
Growing Degrees	5	7.1	6.2	6.3	9.1	6.3	11.9	10.5	9.4	10.4	9.5	86.5	-	-
	10	2.1	1.2	1.3	4.1	1.3	6.9	5.5	4.4	5.4	4.5	36.5	-	-

1st 10-day period (1-10/11/2014)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	11.4	-	
Precipitation - Reference Evapotranspiration	24.2	-	19.6
Number of Rainy Days	1.0	-	3.1
Number of Dry Days	7.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

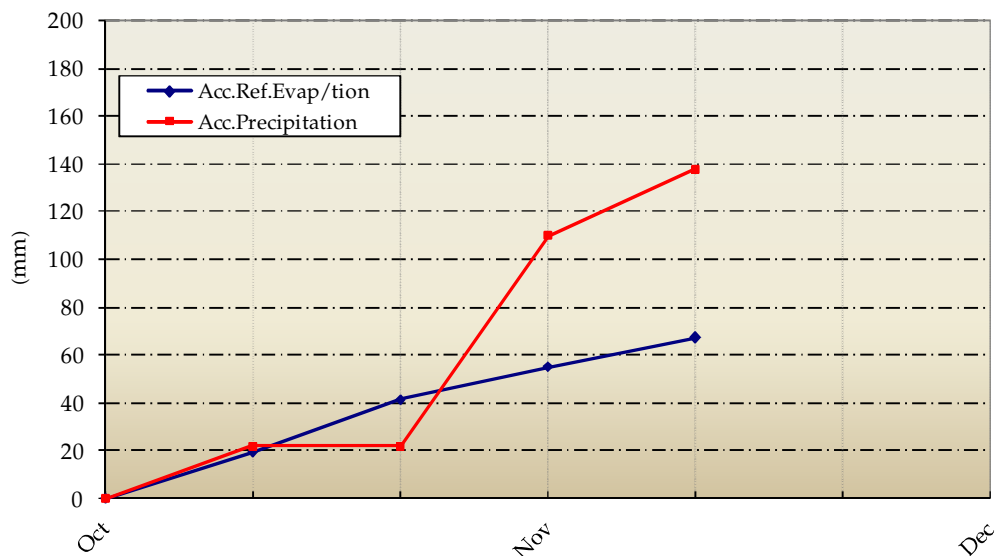


Tripoli

1st 10-day period (1-10/11/2014)		1	2	3	4	5	6	7	8	9	10	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	12.6	15.2	17.0	17.4	18.2	19.7	16.4	13.0	17.9	20.0	16.7	20.7	16.5
	Min	4.4	5.0	1.0	1.1	2.8	5.7	11.0	8.3	6.3	7.5	5.3	5.8	5.2
Relative Humidity	Max	83	100	100	100	100	100	100	100	100	100	98	93	-
	Min	53	44	33	43	53	61	79	70	54	42	53	53	-
Soil Temperature at 10 cm	06 UTC	-	-	8.4	8.4	9.2	11.0	13.2	12.2	11.8	12.0	10.8	12.0	11.0
	12 UTC	-	-	12.4	12.4	13.4	14.6	14.8	-	-	14.2	13.6	15.9	12.3
Sunshine Duration		-	0.0	6.5	8.7	4.3	7.0	0.0	3.1	5.7	5.1	4.5	6.7	5.1
Precipitation						0.6		2.6	24.6			27.8	11.0	28.3
Evaporation		-	-	1.1	0.8	1.1	0.5	1.9	0.8	0.3	0.7	-	15.5	18.0
Growing Degrees	5	3.5	5.1	4.0	4.3	5.5	7.7	8.7	5.7	7.1	8.8	60.3	82.8	58.6
	10	0.0	0.1	0.0	0.0	0.5	2.7	3.7	0.7	2.1	3.8	13.5	32.8	17.0

1st 10-day period (1-10/11/2014)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	12.1	13.9	13.6
Precipitation - Reference Evapotranspiration	15.7	-2.9	14.7
Number of Rainy Days	3.0	2.0	2.6
Number of Dry Days	5.0	18.0	-

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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