



AGROMETEOROLOGICAL BULLETIN

November 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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Division of Climatology-Applications
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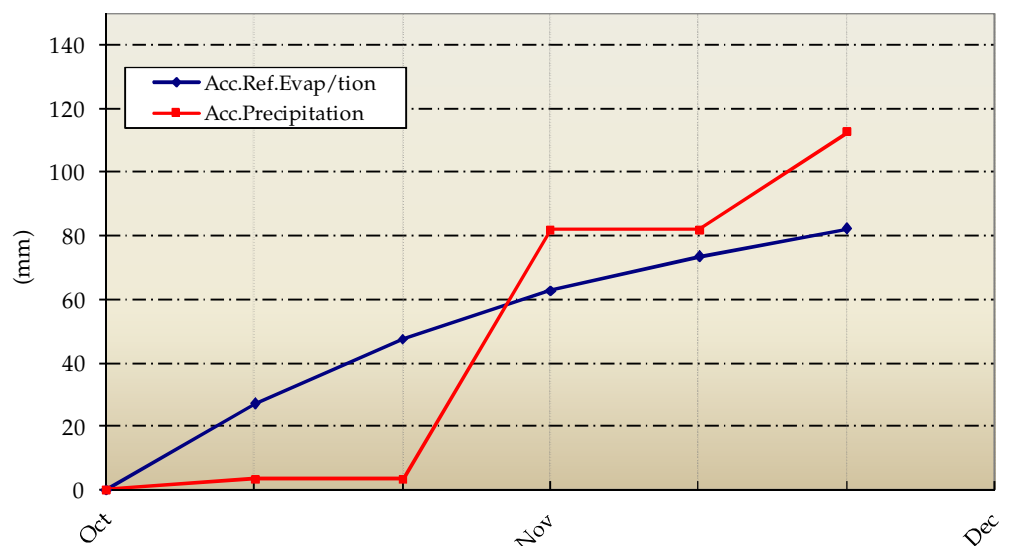
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www.hnms.gr
www.emy.gov.gr
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www.meteohellas.gr

Alexandroupoli

2nd 10-day period (11-20/11/2014)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	16.2	17.4	16.8	15.2	13.4	14.4	15.2	16.8	19.2	17.8	16.2	16.3	14.4
	Min	10.2	13.2	12.6	12.4	10.4	9.8	10.2	8.8	12.2	8.4	10.8	8.6	6.2
Relative Humidity	Max	97	95	95	95	87	87	95	95	93	94	93	91	-
	Min	75	68	75	81	69	60	76	83	72	72	73	58	-
Soil Temperature at 10 cm	06 UTC	13.0	14.0	14.0	14.2	12.8	11.8	12.0	11.8	13.6	12.8	13.0	12.3	9.7
	12 UTC	15.6	16.2	15.6	14.6	12.8	13.4	14.0	13.6	15.4	14.0	14.5	13.8	11.5
Sunshine Duration		0.0	1.8	0.3	0.0	0.2	0.1	0.7	0.8	1.4	1.8	0.7	3.6	3.9
Precipitation				10.2	10.5	0.3		0.0		3.9	5.9	30.8	30.1	29.1
Evaporation		0.8	0.2	1.7	0.6	2.2	0.2	0.0	0.9	1.4	1.8	9.8	23.1	18.6
Growing Degrees	5	8.2	10.3	9.7	8.8	6.9	7.1	7.7	7.8	10.7	8.1	85.3	74.7	54.2
	10	3.2	5.3	4.7	3.8	1.9	2.1	2.7	2.8	5.7	3.1	35.3	26.8	17.6

2nd 10-day period (11-20/11/2014)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	8.8	12.0	11.3
Precipitation - Reference Evapotranspiration	22.0	18.1	17.8
Number of Rainy Days	5.0	2.0	2.9
Number of Dry Days	3.0	7.0	-

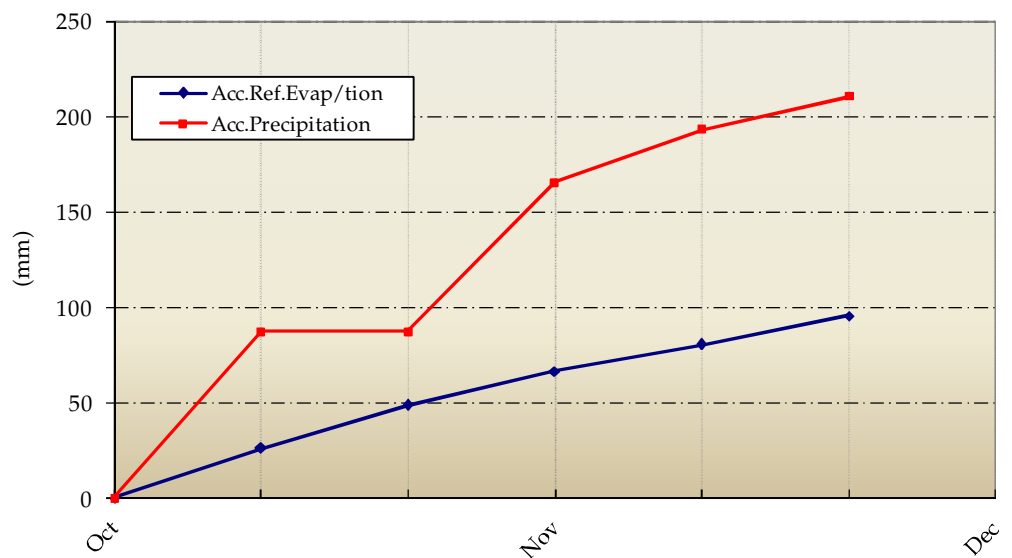
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



2nd 10-day period (11-20/11/2014)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	22.6	23.0	22.0	18.8	20.6	20.7	22.6	22.2	22.7	18.9	21.4	19.5	18.6
	Min	11.0	11.2	15.2	12.0	9.6	11.2	16.0	14.2	17.0	13.6	13.1	12.1	9.7
Relative Humidity	Max	92	91	91	91	92	90	89	86	79	87	89	92	-
	Min	51	48	45	61	58	68	63	63	55	44	56	60	-
Soil Temperature at 10 cm	06 UTC	14.2	15.8	15.8	16.2	15.2	15.4	16.6	16.6	17.0	16.2	15.9	15.6	13.2
	12 UTC	17.4	17.6	18.0	18.2	18.6	15.2	17.6	18.2	18.8	18.0	17.8	17.1	15.2
Sunshine Duration		7.2	2.2	4.4	8.8	8.8	1.1	6.6	6.7	4.7	8.0	5.8	3.6	4.9
Precipitation				15.5			1.0	0.8				17.3	150.2	50.9
Evaporation		2.6	12.3	0.2	2.4	3.8	3.0	2.0	1.8	4.2	2.0	34.3	122.6	21.4
Growing Degrees	5	11.8	12.1	13.6	10.4	10.1	11.0	14.3	13.2	14.9	11.3	122.6	108.0	91.7
	10	6.8	7.1	8.6	5.4	5.1	6.0	9.3	8.2	9.9	6.3	72.6	58.0	42.4

2nd 10-day period (11-20/11/2014)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	15.1	12.5	11.8
Precipitation - Reference Evapotranspiration	2.2	137.7	39.1
Number of Rainy Days	3.0	5.0	4.2
Number of Dry Days	4.0	4.0	-

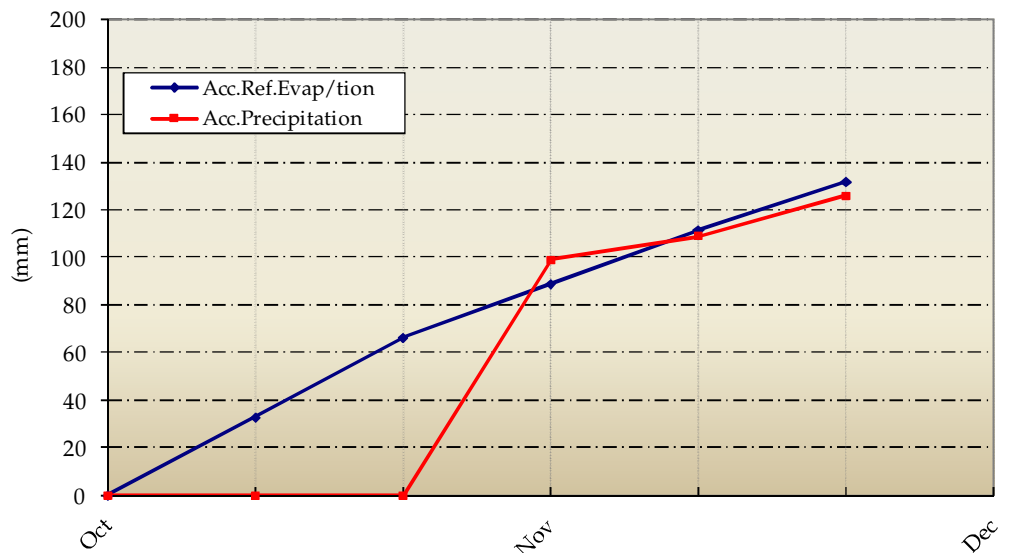
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



2nd 10-day period (11-20/11/2014)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	21.4	24.2	25.4	21.6	19.4	19.6	21.0	24.6	25.0	20.4	22.3	21.8	19.7
	Min	16.0	15.0	19.4	15.0	15.2	14.0	13.0	16.2	18.0	18.8	16.1	16.1	13.2
Relative Humidity	Max	94	89	88	89	91	89	88	82	75	77	86	84	-
	Min	73	48	54	57	76	66	65	59	56	60	61	58	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
Sunshine Duration		6.1	5.2	2.5	7.8	2.5	4.9	4.9	8.2	5.3	2.1	5.0	5.4	4.9
Precipitation					1.9	15.2	0.1					17.2	17.4	22.2
Evaporation		2.7	3.0	0.1	3.8	2.1	0.9	4.3	4.0	2.6	2.9	26.4	26.0	33.6
Growing Degrees	5	13.7	14.6	17.4	13.3	12.3	11.8	12.0	15.4	16.5	14.6	141.6	139.6	114.3
	10	8.7	9.6	12.4	8.3	7.3	6.8	7.0	10.4	11.5	9.6	91.6	89.6	64.3

2nd 10-day period (11-20/11/2014)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	20.2	21.8	-
Precipitation - Reference Evapotranspiration	-3.0	-4.4	22.2
Number of Rainy Days	3.0	3.0	2.7
Number of Dry Days	4.0	6.0	-

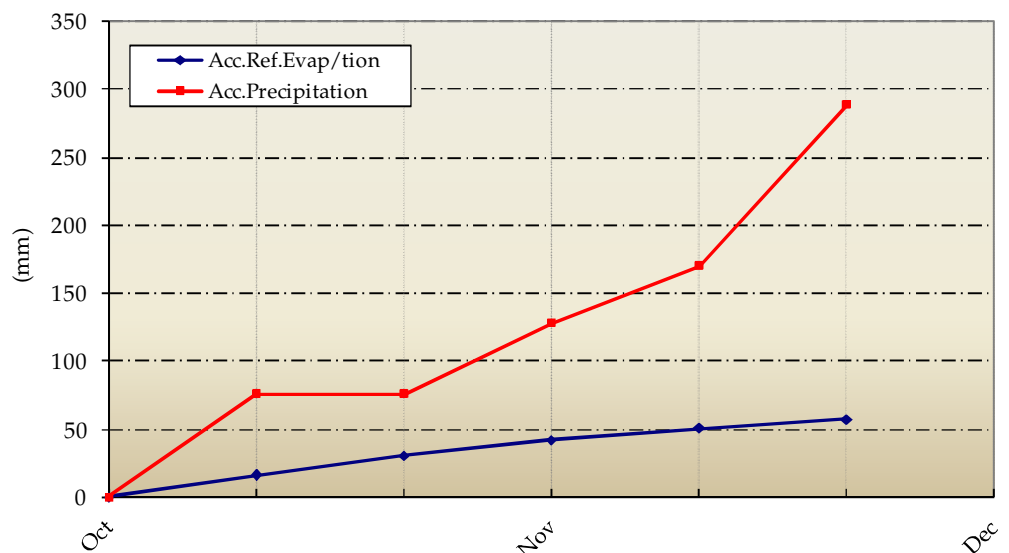
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



2nd 10-day period (11-20/11/2014)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	18.0	18.9	13.8	14.6	17.3	12.8	17.6	17.8	18.0	14.8	16.4	16.2	13.9
	Min	5.0	6.3	10.4	6.0	5.3	7.4	10.3	5.0	10.0	3.0	6.9	7.8	4.6
Relative Humidity	Max	100	100	100	100	100	100	100	100	100	100	100	88	-
	Min	62	61	84	80	85	97	64	73	63	58	73	51	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	8.9
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	10.1
Sunshine Duration		3.7	0.6	0.0	0.0	2.4	0.0	1.7	0.5	2.5	3.4	1.5	2.2	3.0
Precipitation		0.1	0.0	36.3		0.0	11.0	37.5	0.1	33.4	0.0	118.4	74.4	63.6
Evaporation		-	-	-	-	-	-	-	-	-	-	-	-	13.4
Growing Degrees	5	6.5	7.6	7.1	5.3	6.3	5.1	9.0	6.4	9.0	3.9	66.2	69.7	44.8
	10	1.5	2.6	2.1	0.3	1.3	0.1	4.0	1.4	4.0	0.0	17.3	22.4	8.8

2nd 10-day period (11-20/11/2014)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	6.9	11.5	7.9
Precipitation - Reference Evapotranspiration	111.5	62.9	55.7
Number of Rainy Days	6.0	4.0	4.4
Number of Dry Days	2.0	0.0	-

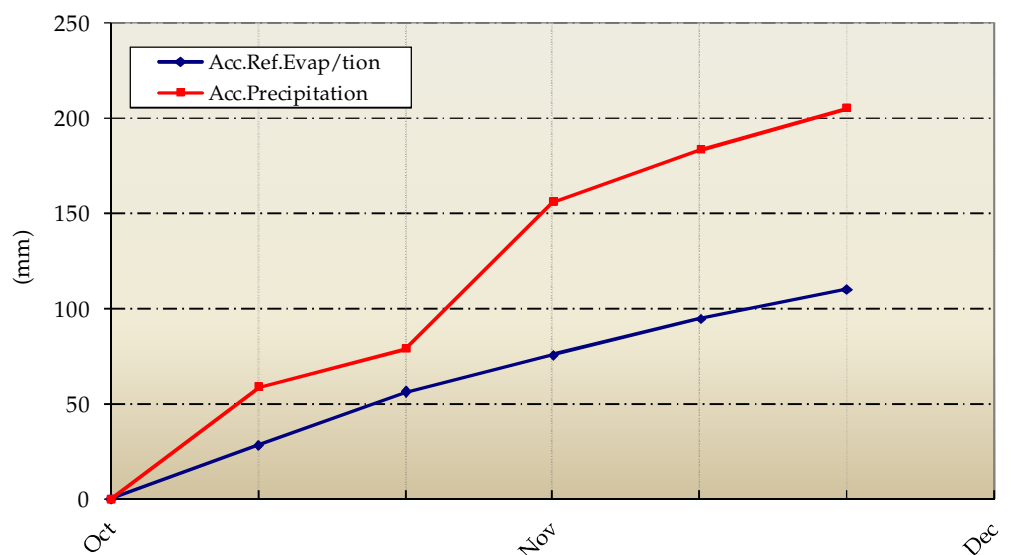
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



2nd 10-day period (11-20/11/2014)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	24.2	21.7	21.9	20.9	22.0	20.0	23.4	22.4	22.3	20.0	21.9	19.9	19.5
	Min	12.2	11.6	13.0	10.3	9.8	10.7	13.9	11.0	11.1	10.4	11.4	12.5	9.3
Relative Humidity	Max	94	95	96	95	93	94	95	95	95	94	95	89	-
	Min	49	61	69	52	46	66	58	65	72	38	58	60	-
Soil Temperature at 10 cm	06 UTC	16.6	16.6	17.0	16.6	16.0	16.0	15.0	16.6	16.4	16.2	16.3	-	14.0
	12 UTC	17.4	17.0	16.2	17.0	16.4	16.4	17.4	17.4	17.0	16.4	16.9	-	15.4
Sunshine Duration		7.1	0.0	3.4	8.1	8.8	2.1	7.3	7.7	3.4	8.6	5.6	3.6	4.6
Precipitation				12.4	9.1			0.3		0.0		21.8	240.7	55.3
Evaporation		-	-	-	-	-	-	-	-	-	-	-	-	22.8
Growing Degrees	5	13.2	11.7	12.5	10.6	10.9	10.4	13.7	11.7	11.7	10.2	116.4	112.1	93.9
	10	8.2	6.7	7.5	5.6	5.9	5.4	8.7	6.7	6.7	5.2	66.4	62.1	44.2

2nd 10-day period (11-20/11/2014)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	15.5	15.1	13.4
Precipitation - Reference Evapotranspiration	6.3	225.6	41.9
Number of Rainy Days	3.0	5.0	3.8
Number of Dry Days	4.0	4.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

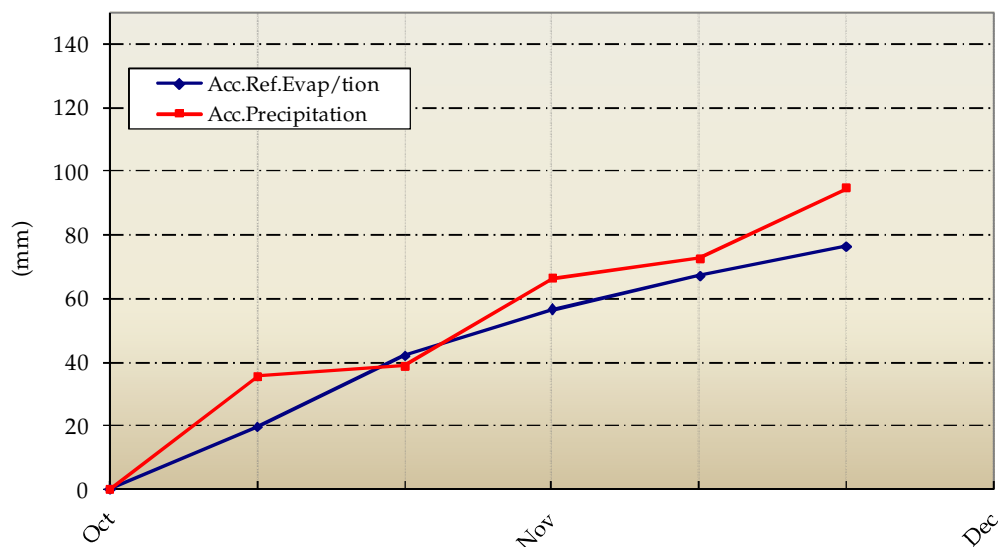


Larisa

2nd 10-day period (11-20/11/2014)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	23.0	17.2	22.2	16.9	17.0	16.2	20.6	16.2	18.8	17.6	18.6	16.4	15.3
	Min	10.3	12.4	19.4	10.0	13.2	12.2	13.2	9.6	9.4	9.2	11.9	8.9	5.5
Relative Humidity	Max	100	90	100	100	100	100	100	100	100	82	97	96	-
	Min	72	65	67	72	72	77	73	86	50	42	68	63	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	10.9
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	11.6
Sunshine Duration		0.0	0.0	1.0	0.0	0.0	0.0	1.9	0.0	3.6	7.6	1.4	1.2	3.5
Precipitation				3.8	0.2	6.5	0.5	4.0		7.2		22.2	11.9	21.2
Evaporation		2.6	0.0	-	7.4	0.0	2.3	0.2	0.0	0.3	1.5	-	9.3	13.7
Growing Degrees	5	11.7	9.8	15.8	8.5	10.1	9.2	11.9	7.9	9.1	8.4	102.3	76.7	54.7
	10	6.7	4.8	10.8	3.5	5.1	4.2	6.9	2.9	4.1	3.4	52.3	29.5	14.5

2nd 10-day period (11-20/11/2014)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	9.4	11.1	8.8
Precipitation - Reference Evapotranspiration	12.8	0.8	12.4
Number of Rainy Days	6.0	6.0	3.4
Number of Dry Days	4.0	4.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

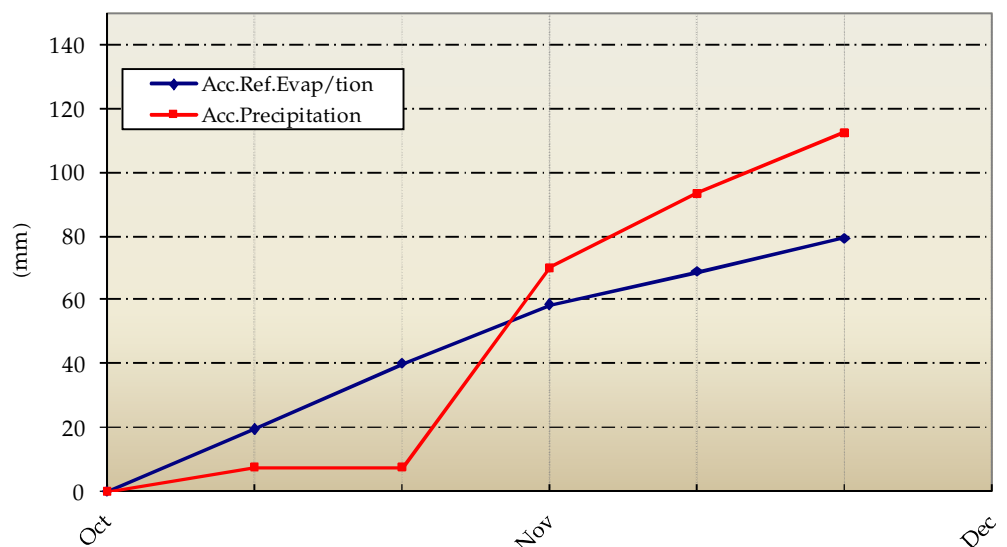


Mikra

2nd 10-day period (11-20/11/2014)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	16.0	17.0	16.9	17.0	16.4	16.4	17.7	17.8	18.2	15.8	16.9	17.4	14.7
	Min	9.7	12.9	13.3	12.6	13.2	13.2	12.8	10.7	11.5	12.5	12.2	11.6	6.8
Relative Humidity	Max	93	93	90	95	93	88	93	93	94	72	90	82	-
	Min	82	69	88	80	82	55	66	73	65	41	70	53	-
Soil Temperature at 10 cm	06 UTC	14.0	15.0	15.2	15.0	15.4	15.0	14.4	14.4	14.4	13.0	14.6	14.6	10.3
	12 UTC	15.4	15.8	16.2	16.0	16.4	15.4	16.2	15.8	15.0	13.8	15.6	16.4	12.2
Sunshine Duration		0.0	0.0	0.0	0.4	0.5	0.2	1.1	0.8	0.9	7.9	1.2	2.1	3.5
Precipitation				2.7	1.1	3.1		3.0		9.3		19.2	9.4	21.1
Evaporation		0.8	0.6	1.1	4.1	0.5	0.2	3.0	0.6	2.7	3.8	17.4	16.3	18.7
Growing Degrees	5	7.9	10.0	10.1	9.8	9.8	9.8	10.3	9.3	9.9	9.2	95.8	95.4	57.6
	10	2.9	5.0	5.1	4.8	4.8	4.8	5.3	4.3	4.9	4.2	45.8	45.4	17.1

2nd 10-day period (11-20/11/2014)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	10.6	10.7	11.2
Precipitation - Reference Evapotranspiration	8.6	-1.3	9.9
Number of Rainy Days	5.0	3.0	3.0
Number of Dry Days	3.0	3.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

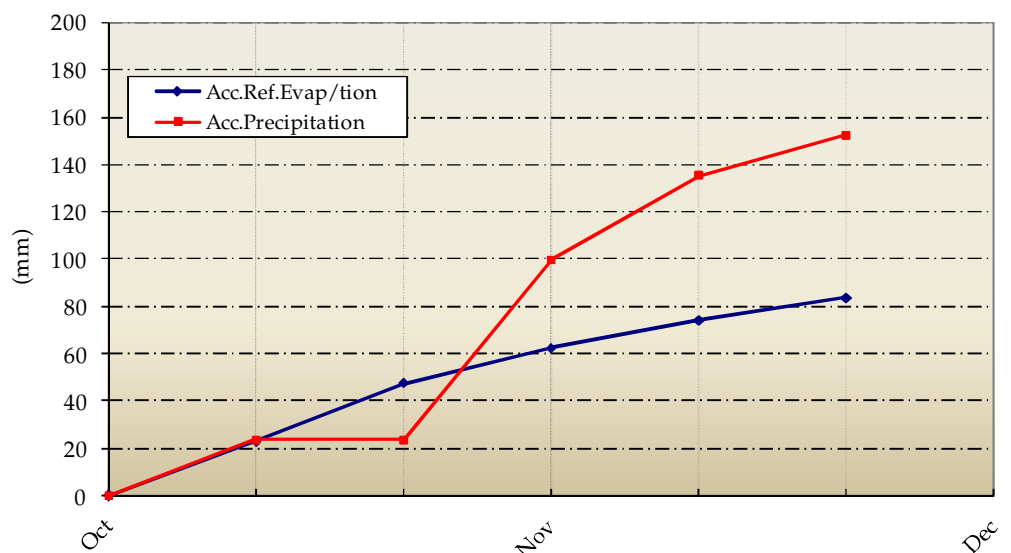


Tanagra

2nd 10-day period (11-20/11/2014)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	18.7	16.8	20.8	14.4	15.2	17.0	22.3	22.0	22.4	17.2	18.7	17.5	17.8
	Min	10.0	8.8	10.9	12.4	13.6	8.9	9.1	8.1	15.2	8.9	10.6	11.1	8.3
Relative Humidity	Max	100	100	100	100	100	100	100	100	76	85	96	97	-
	Min	59	77	62	88	82	63	54	48	53	39	62	66	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
Sunshine Duration		4.2	0.3	5.2	0.0	0.2	2.3	4.9	4.0	2.1	8.3	3.2	-	-
Precipitation					12.2	4.8						17.0	73.8	21.4
Evaporation		1.5	2.0	0.5	0.5	2.2	0.8	1.5	2.0	3.8	3.5	18.3	-	-
Growing Degrees	5	9.4	7.8	10.9	8.4	9.4	8.0	10.7	10.1	13.8	8.1	96.4	-	-
	10	4.4	2.8	5.9	3.4	4.4	3.0	5.7	5.1	8.8	3.1	46.4	-	-

2nd 10-day period (11-20/11/2014)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	9.8	-	-
Precipitation - Reference Evapotranspiration	7.2		21.4
Number of Rainy Days	2.0		3.7
Number of Dry Days	5.0		-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

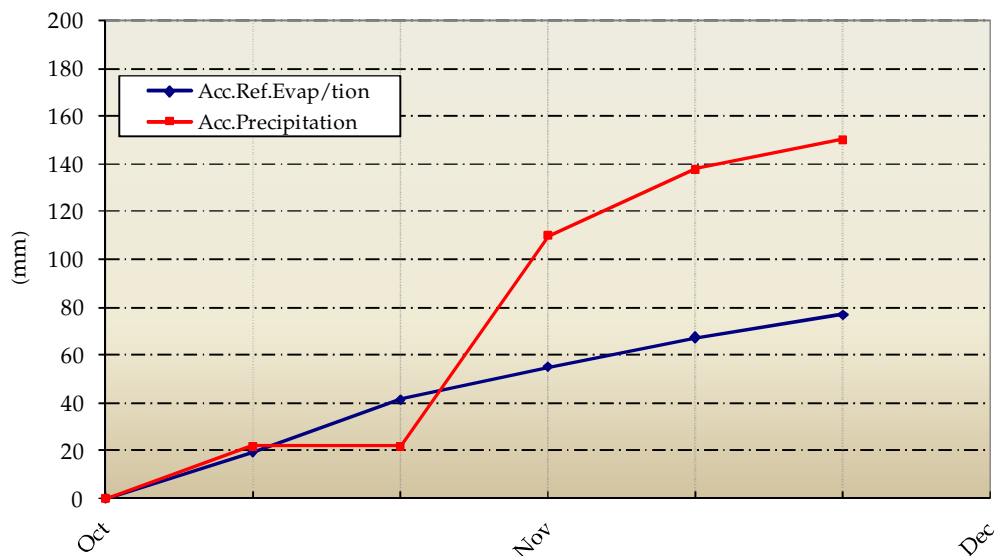


Tripoli

2nd 10-day period (11-20/11/2014)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	17.8	15.2	18.1	17.9	16.6	13.6	18.7	19.6	18.0	16.3	17.2	14.8	14.9
	Min	7.5	11.0	9.3	5.5	2.9	5.9	11.8	7.2	8.1	6.5	7.6	7.7	4.4
Relative Humidity	Max	100	100	100	100	100	100	100	100	98	100	100	95	-
	Min	64	77	59	48	59	90	52	46	60	31	59	68	-
Soil Temperature at 10 cm	06 UTC	12.0	13.2	13.0	11.6	10.0	11.2	12.6	11.4	12.0	11.0	11.8	11.2	9.7
	12 UTC	15.0	14.4	15.4	14.0	-	-	14.8	14.0	13.6	13.2	14.3	12.9	10.8
Sunshine Duration		5.7	0.0	2.7	3.2	4.1	0.0	6.3	7.0	2.8	9.0	4.1	3.0	4.5
Precipitation				2.8	3.1		0.0	2.0		4.5		12.4	125.3	45.7
Evaporation		0.7	0.3	1.1	0.2	1.6	0.2	1.0	0.8	0.6	0.3	6.8	93.4	15.6
Growing Degrees	5	7.7	8.1	8.7	6.7	4.8	4.8	10.3	8.4	8.1	6.4	73.8	62.7	46.8
	10	2.7	3.1	3.7	1.7	0.0	0.0	5.3	3.4	3.1	1.4	24.3	14.7	10.1

2nd 10-day period (11-20/11/2014)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	9.8	9.4	10.5
Precipitation - Reference Evapotranspiration	2.6	115.9	35.2
Number of Rainy Days	4.0	5.0	4.0
Number of Dry Days	4.0	4.0	-

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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