



AGROMETEOROLOGICAL BULLETIN

December 2014
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



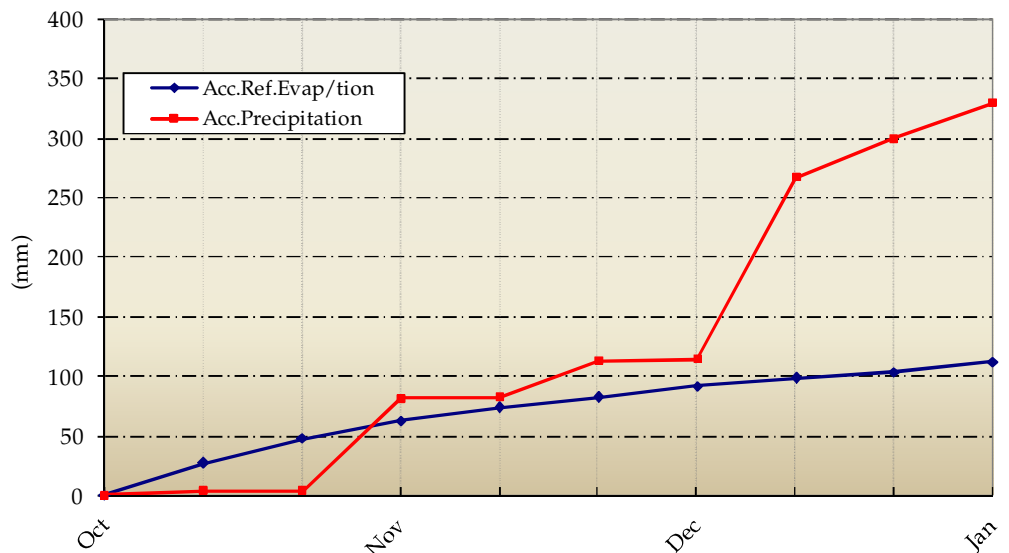
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www.hnms.gr
www.emy.gov.gr
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3rd 10-day period (21-31/12/2014)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	11.6	9.8	13.4	15.4	16.8	12.8	8.4	10.2	13.8	4.2	-0.2	10.6	9.6	9.8
	Min	3.0	-0.6	3.6	4.2	4.4	7.6	2.6	0.0	3.8	-2.0	-4.0	2.1	0.5	2.4
Relative Humidity	Max	95	82	91	97	98	92	97	89	93	96	85	92	93	-
	Min	51	50	52	62	75	72	83	69	58	69	73	65	65	-
Soil Temperature at 10 cm	06 UTC	6.6	4.6	4.4	5.1	6.5	9.6	7.4	3.2	10.0	4.6	2.0	5.8	5.1	6.0
	12 UTC	7.0	7.0	8.0	9.2	10.1	10.0	6.8	5.8	10.8	4.2	1.8	7.3	6.5	7.2
Sunshine Duration		0.0	7.8	7.9	7.7	6.2	0.2	0.0	1.9	3.3	0.0	0.0	3.2	2.9	2.6
Precipitation		0.1					0.3	16.1	0.3	13.0	0.0	0.0	29.8	2.0	24.7
Evaporation		0.0	0.0	0.6	1.9	0.1	0.3	0.0	0.0	0.0	0.0	0.0	2.9	3.7	12.0
Growing Degrees	5	2.3	0.0	3.5	4.8	5.6	5.2	0.5	0.1	3.8	0.0	0.0	25.8	13.5	24.9
	10	0.0	0.0	0.0	0.0	0.6	0.2	0.0	0.0	0.0	0.0	0.0	0.8	2.9	4.2

3rd 10-day period (21-31/12/2014)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	8.8	6.8	8.4
Precipitation - Reference Evapotranspiration	21.0	-4.8	16.3
Number of Rainy Days	5.0	2.0	2.9
Number of Dry Days	2.0	13.0	-

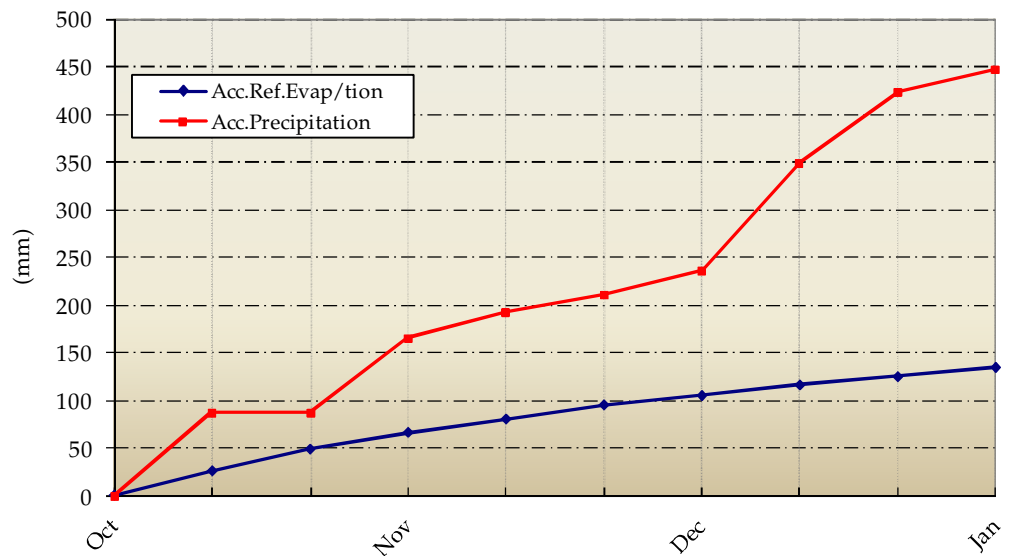
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



3rd 10-day period (21-31/12/2014)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	18.0	15.2	15.7	17.6	14.3	14.5	13.2	14.6	16.4	9.6	8.6	14.3	16.1	14.4
	Min	8.8	4.6	2.1	6.2	0.0	10.0	7.9	4.5	9.3	6.2	2.4	5.6	5.2	6.0
Relative Humidity	Max	90	85	88	92	90	91	90	88	90	90	76	88	90	-
	Min	57	44	51	60	78	70	45	55	56	61	49	57	57	-
Soil Temperature at 10 cm	06 UTC	9.8	11.4	10.6	10.2	12.0	12.2	12.0	10.0	10.6	11.4	9.6	10.9	9.0	9.0
	12 UTC	14.4	14.4	14.2	13.6	13.4	12.0	11.6	10.6	12.0	11.4	9.4	12.5	10.8	10.5
Sunshine Duration		7.3	7.7	7.5	7.5	0.0	1.4	5.9	0.0	3.9	0.4	0.0	3.8	4.2	4.0
Precipitation							1.9	3.4	10.7	5.5	1.9		23.4	28.8	44.5
Evaporation		2.0	3.2	3.8	1.8	1.1	3.6	0.8	1.2	2.8	0.6	1.0	21.9	19.2	21.9
Growing Degrees	5	8.4	4.9	3.9	6.9	2.2	7.3	5.6	4.6	7.9	2.9	0.5	54.9	62.0	57.7
	10	3.4	0.0	0.0	1.9	0.0	2.3	0.6	0.0	2.9	0.0	0.0	11.0	13.3	13.8

3rd 10-day period (21-31/12/2014)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	9.8	10.4	9.5
Precipitation - Reference Evapotranspiration	13.6	18.4	35.0
Number of Rainy Days	5.0	4.0	4.8
Number of Dry Days	7.0	7.0	-

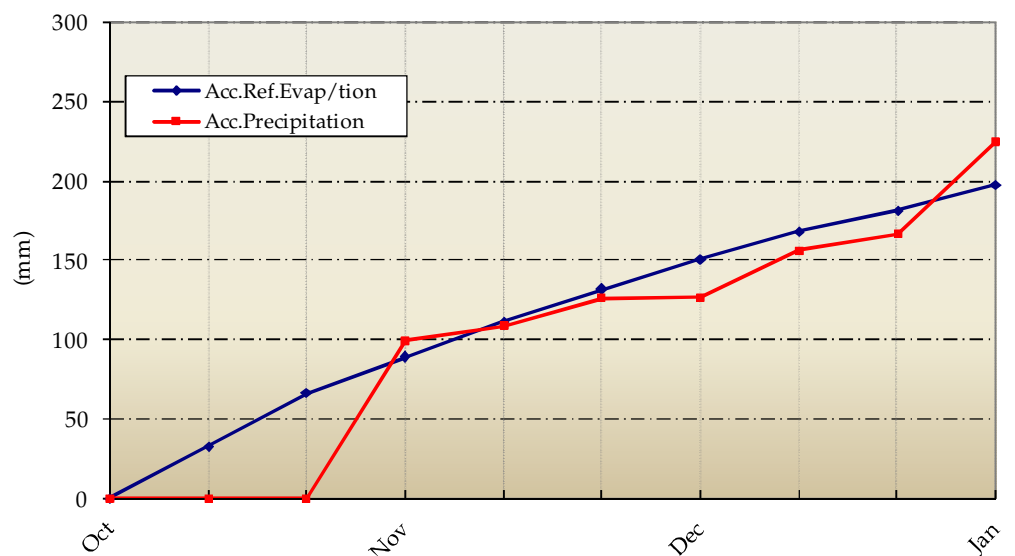
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



3rd 10-day period (21-31/12/2014)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	19.4	14.4	16.6	18.2	17.8	18.0	17.0	18.8	18.0	17.0	11.6	17.0	16.5	15.9
	Min	10.0	13.6	8.6	9.4	8.6	11.0	12.4	7.2	14.2	12.0	8.0	10.5	10.4	10.0
Relative Humidity	Max	85	79	88	88	87	83	88	83	88	91	94	87	90	-
	Min	53	54	56	67	71	58	58	46	59	62	76	60	67	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sunshine Duration		6.9	5.2	5.5	8.0	8.0	4.8	1.9	8.0	3.4	2.7	0.0	4.9	3.4	3.8
Precipitation			0.6					3.0		2.6	3.4	48.9	58.5	59.5	34.5
Evaporation		2.0	2.8	3.0	0.7	0.7	2.4	1.6	3.9	1.6	0.4	4.3	23.4	22.0	28.1
Growing Degrees	5	9.7	9.0	7.6	8.8	8.2	9.5	9.7	8.0	11.1	9.5	4.8	95.9	93.0	87.3
	10	4.7	4.0	2.6	3.8	3.2	4.5	4.7	3.0	6.1	4.5	0.0	41.1	38.0	33.4

3rd 10-day period (21-31/12/2014)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	16.2	12.8	-
Precipitation - Reference Evapotranspiration	42.3	46.7	34.5
Number of Rainy Days	5.0	6.0	4.5
Number of Dry Days	1.0	0.0	-

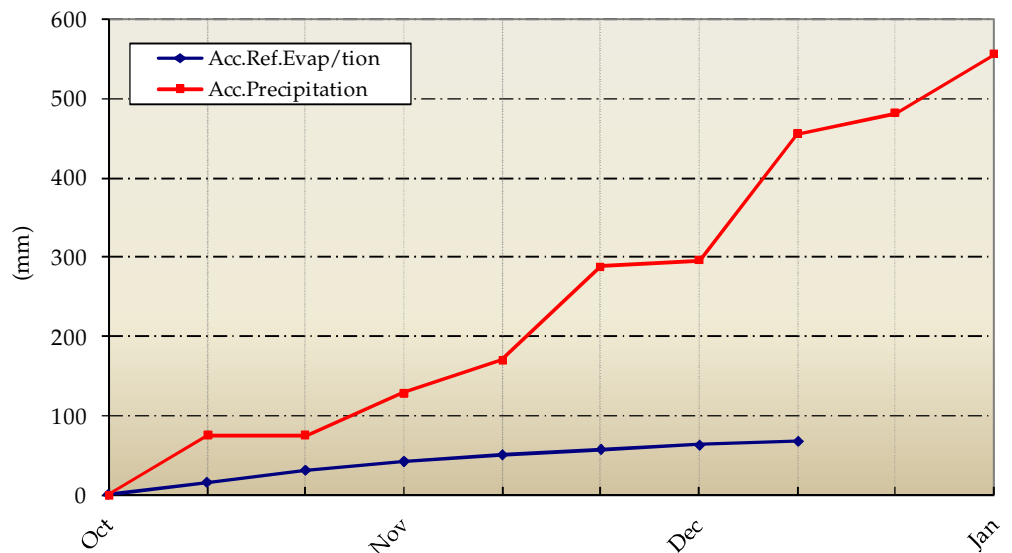
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



3rd 10-day period (21-31/12/2014)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	9.6	9.7	10.5	12.8	7.0	16.3	7.3	7.6	8.8	3.2	-	9.3	9.9	8.8
	Min	-0.3	-3.5	-5.5	-3.9	-3.8	4.3	-0.6	-4.2	3.0	-1.9	-2.9	-1.8	-1.5	0.9
Relative Humidity	Max	-	-	100	100	-	-	97	100	-	-	-	99	95	-
	Min	-	-	-	-	-	-	-	-	-	-	-	-	52	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-	4.0
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-	4.7
Sunshine Duration		-	-	-	-	-	-	-	-	-	-	-	-	2.5	2.4
Precipitation		0.0	-	-	-	-	2.7	0.2	26.6	45.2	-	0.0	74.7	56.8	50.6
Evaporation		-	-	-	-	-	-	-	-	-	-	-	-	-	9.0
Growing Degrees	5	0.0	0.0	0.0	0.0	0.0	5.3	0.0	0.0	0.9	0.0	-	-	10.9	14.1
	10	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	-	-	0.0	0.9

3rd 10-day period (21-31/12/2014)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	-	6.6	6.2
Precipitation - Reference Evapotranspiration	-	50.2	44.4
Number of Rainy Days	4.0	4.0	4.3
Number of Dry Days	7.0	16.0	-

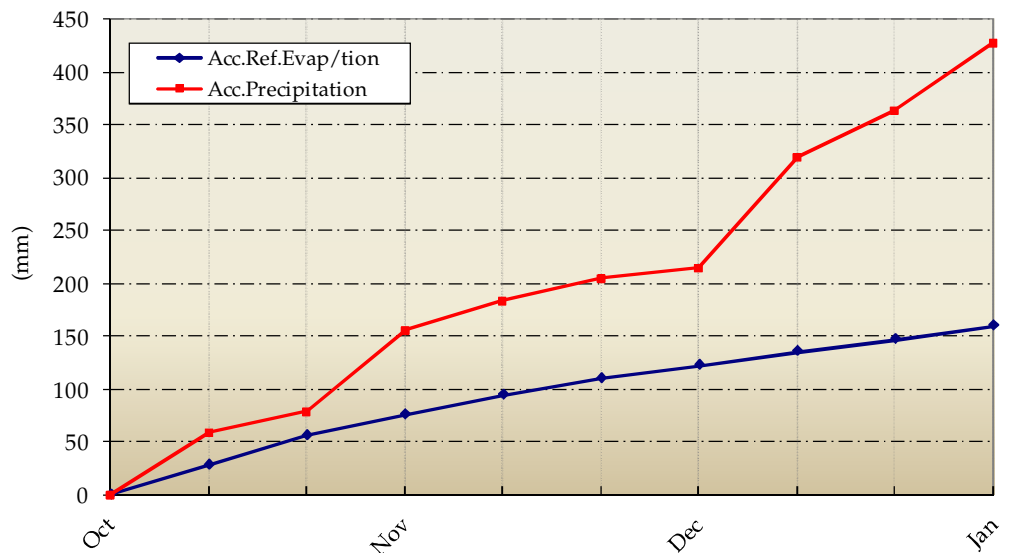
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



3rd 10-day period (21-31/12/2014)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	18.6	15.1	17.0	20.2	14.5	16.8	14.8	15.0	16.7	9.2	9.4	15.2	17.6	15.2
	Min	7.2	7.3	3.5	4.5	4.5	9.0	5.4	1.3	9.2	4.6	4.1	5.5	6.1	6.1
Relative Humidity	Max	93	90	88	94	93	95	96	96	91	94	54	89	91	-
	Min	51	50	34	42	84	44	41	68	52	83	44	54	51	-
Soil Temperature at 10 cm	06 UTC	11.4	11.4	11.0	10.4	11.2	11.4	11.0	9.4	11.2	11.2	9.6	10.8	9.2	10.0
	12 UTC	12.0	11.8	11.0	11.0	11.0	12.0	11.6	10.4	11.4	11.0	9.6	11.2	9.8	10.9
Sunshine Duration		5.4	2.9	9.2	0.8	0.0	1.8	5.4	1.3	2.6	0.0	5.1	3.1	4.4	3.9
Precipitation							1.0	1.5	21.5	8.9	23.3	7.8	64.0	50.5	41.5
Evaporation		-	-	-	-	-	-	-	-	-	-	-	-	-	22.7
Growing Degrees	5	7.9	6.2	5.3	7.4	4.5	7.9	5.1	3.2	8.0	1.9	1.8	59.0	75.4	62.1
	10	2.9	1.2	0.3	2.4	0.0	2.9	0.1	0.0	3.0	0.0	0.0	12.7	21.2	14.5

3rd 10-day period (21-31/12/2014)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	12.8	13.5	11.8
Precipitation - Reference Evapotranspiration	51.2	37.0	29.7
Number of Rainy Days	6.0	4.0	4.8
Number of Dry Days	7.0	20.0	-

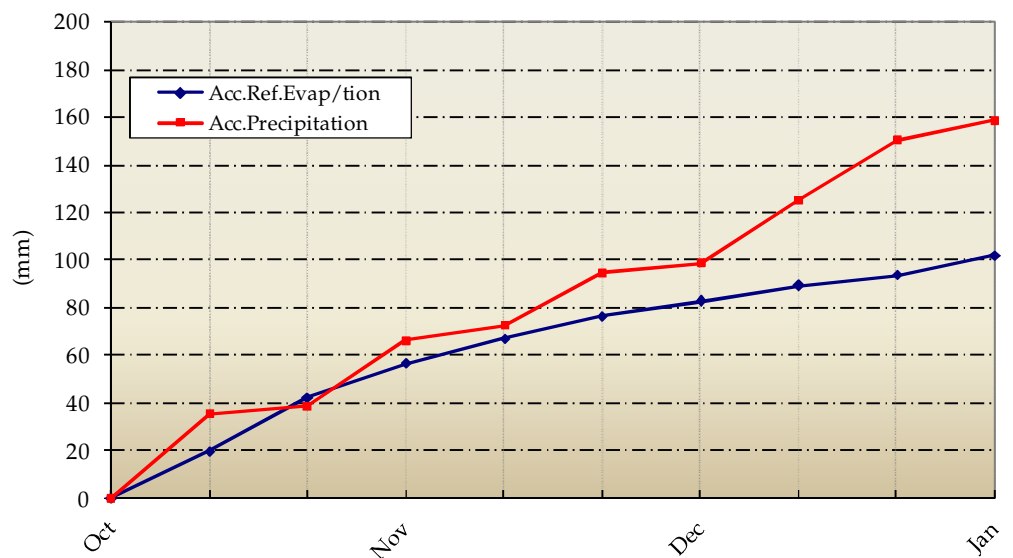
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



3rd 10-day period (21-31/12/2014)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	12.6	10.6	13.0	15.0	14.4	11.0	9.1	6.2	11.4	3.4	1.6	9.8	10.8	10.0
	Min	3.1	-0.8	-2.6	-1.8	-1.0	1.0	2.8	-3.6	2.7	-2.2	-2.2	-0.4	1.0	1.1
Relative Humidity	Max	100	98	100	100	100	100	100	100	100	100	100	100	98	-
	Min	36	35	41	49	56	82	36	74	50	35	47	49	72	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-	5.7
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-	6.1
Sunshine Duration		3.1	7.3	7.0	7.0	6.3	0.5	7.2	0.0	6.7	0.0	0.0	4.1	2.7	3.0
Precipitation								0.1	1.6	6.5	0.2	0.0	8.4	21.7	14.0
Evaporation		6.0	2.2	0.0	0.4	0.0	3.9	0.5	0.0	8.5	0.0	0.0	21.5	22.2	7.2
Growing Degrees	5	2.9	0.0	0.2	1.6	1.7	1.0	1.0	0.0	2.1	0.0	0.0	10.4	19.4	18.9
	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	2.0	2.2

3rd 10-day period (21-31/12/2014)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	8.4	5.0	6.4
Precipitation - Reference Evapotranspiration	0.0	16.7	7.6
Number of Rainy Days	4.0	5.0	3.0
Number of Dry Days	9.0	16.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

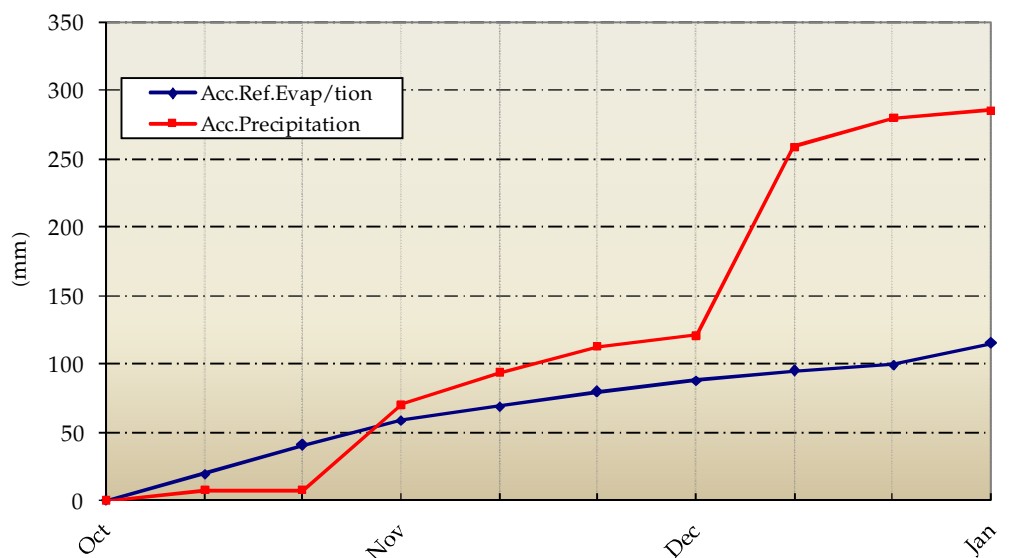


Mikra

3rd 10-day period (21-31/12/2014)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	11.6	11.0	15.2	13.9	10.3	14.0	8.6	6.0	6.5	2.0	1.7	9.2	11.7	10.2
	Min	3.6	3.5	-0.1	1.2	1.1	2.1	4.8	-2.8	2.0	-1.3	-1.1	1.2	3.4	2.2
Relative Humidity	Max	93	81	87	94	97	93	68	89	92	72	77	86	91	-
	Min	42	33	34	59	64	47	35	66	50	49	48	48	67	-
Soil Temperature at 10 cm	06 UTC	7.8	6.6	5.2	5.6	7.0	6.8	6.6	3.8	5.8	2.4	1.8	5.4	6.7	5.3
	12 UTC	9.0	17.8	9.0	8.0	8.2	8.4	7.0	4.8	5.4	2.4	2.2	7.5	8.2	6.8
Sunshine Duration		1.8	8.2	8.2	7.8	2.5	6.6	7.6	0.6	3.0	0.0	0.0	4.2	3.0	3.0
Precipitation								2.6		2.6		0.0	5.2	15.3	14.9
Evaporation		0.1	4.1	1.0	0.2	0.2	1.8	0.6	2.8	0.0	0.0	0.0	10.8	3.7	13.5
Growing Degrees	5	2.6	2.3	2.6	2.6	0.7	3.1	1.7	0.0	0.0	0.0	0.0	15.4	31.2	22.3
	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	4.7	3.0

3rd 10-day period (21-31/12/2014)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	15.7	6.5	8.7
Precipitation - Reference Evapotranspiration	-10.5	8.8	6.2
Number of Rainy Days	2.0	4.0	3.0
Number of Dry Days	9.0	21.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

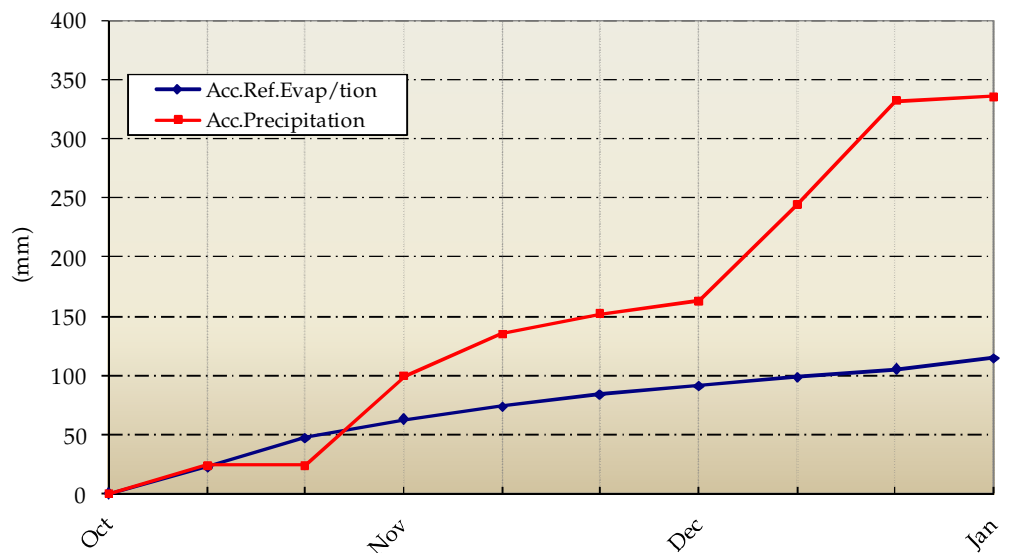


Tanagra

3rd 10-day period (21-31/12/2014)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	16.8	11.8	16.6	17.6	18.0	13.4	9.0	15.0	15.4	3.8	3.2	12.8	13.1	13.1
	Min	1.4	6.9	-1.0	2.7	1.4	2.9	5.4	-1.4	10.9	3.6	-0.6	2.9	5.1	4.6
Relative Humidity	Max	100	98	98	100	100	100	100	100	80	100	100	98	98	-
	Min	47	37	48	50	48	74	57	49	41	60	82	54	65	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sunshine Duration		8.0	7.6	7.4	7.3	7.5	0.3	0.6	0.9	7.2	0.0	0.0	4.3	-	-
Precipitation										0.0	1.2	2.5	3.7	20.1	24.3
Evaporation		4.0	1.7	2.3	2.0	1.0	0.6	2.1	2.5	3.9	1.4	0.0	21.5	-	4.8
Growing Degrees	5	4.1	4.4	2.8	5.2	4.7	3.2	2.2	1.8	8.2	0.0	0.0	36.4	-	-
	10	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	3.2	0.0	0.0	3.3	-	-

3rd 10-day period (21-31/12/2014)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	9.9	-	-
Precipitation - Reference Evapotranspiration	-6.2	-	24.3
Number of Rainy Days	2.0	-	-
Number of Dry Days	12.0	-	-

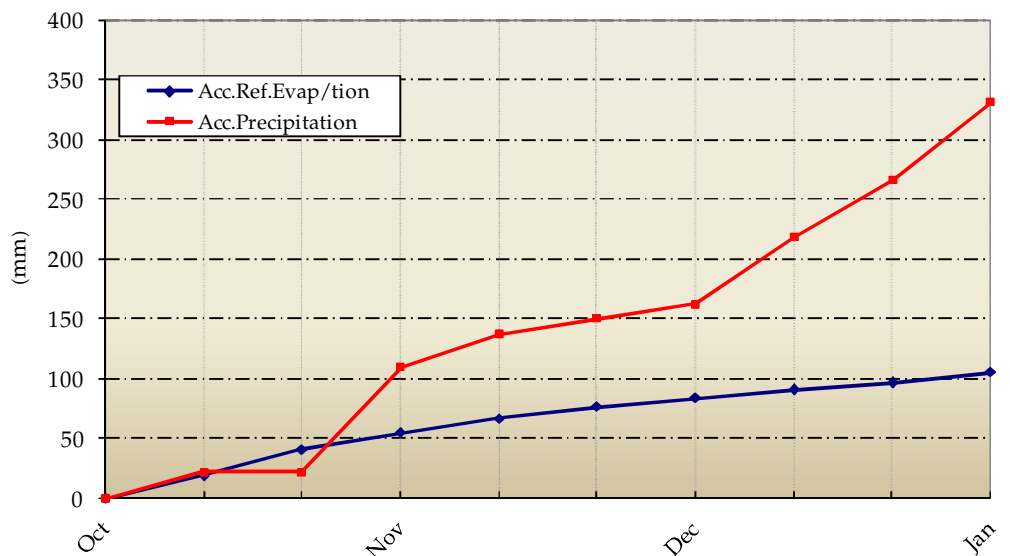
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



3rd 10-day period (21-31/12/2014)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	15.1	9.1	16.9	19.4	13.4	12.8	9.6	8.5	10.3	4.8	1.4	11.0	12.0	9.8
	Min	0.0	2.1	-2.5	-1.9	-1.7	5.4	0.6	-4.3	4.4	-1.6	-1.6	-0.1	0.0	1.5
Relative Humidity	Max	100	100	100	100	100	100	100	100	99	100	100	100	98	-
	Min	45	48	26	29	59	50	30	59	59	92	67	51	64	-
Soil Temperature at 10 cm	06 UTC	4.6	6.4	3.8	3.8	4.0	6.8	7.0	3.2	6.8	5.8	3.4	5.1	4.7	5.3
	12 UTC	-	7.6	6.4	-	-	-	-	-	7.6	4.8	-	6.6	5.9	6.0
Sunshine Duration		7.2	6.7	7.2	7.2	5.4	2.1	6.2	1.9	3.4	0.0	1.1	4.4	2.8	3.7
Precipitation							0.1	2.0	10.0	29.0	21.4	3.0	65.5	45.7	36.8
Evaporation		1.3	0.0	0.0	0.0	0.0	0.5	0.0	0.0	2.1	0.0	0.0	3.9	-	9.0
Growing Degrees	5	2.6	0.6	2.2	3.8	0.9	4.1	0.1	0.0	2.4	0.0	0.0	16.5	14.7	18.6
	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	0.0	1.8

3rd 10-day period (21-31/12/2014)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	8.9	6.6	8.4
Precipitation - Reference Evapotranspiration	56.6	39.1	28.4
Number of Rainy Days	6.0	6.0	4.5
Number of Dry Days	7.0	12.0	-

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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