



AGROMETEOROLOGICAL BULLETIN

December 2015
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



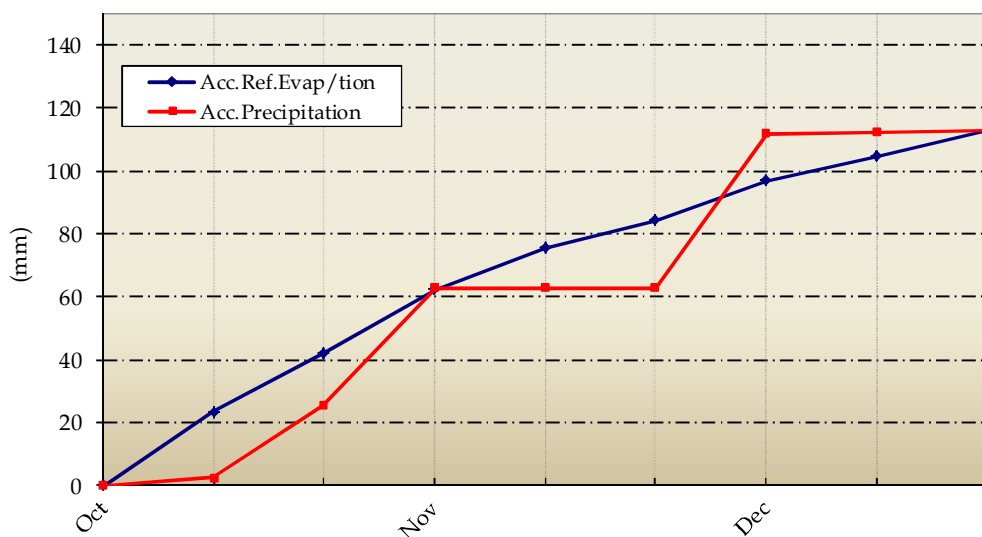
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www.hnms.gr
www.emy.gov.gr
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2nd 10-day period (11-20/12/2015)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	7.8	10.8	11.2	12.2	12.4	9.4	9.6	10.6	10.6	12.2	10.7	12.0	10.6
	Min	5.8	1.4	-2.6	-2.2	3.4	4.2	5.6	1.6	-4.2	-3.8	0.9	4.3	3.1
Relative Humidity	Max	85	86	92	96	81	75	65	88	87	96	85	95	-
	Min	56	41	45	50	48	52	48	39	44	45	47	72	-
Soil Temperature at 10 cm	06 UTC	8.0	6.0	4.0	4.0	6.0	6.9	6.6	5.5	3.0	2.5	5.2	7.4	6.3
	12 UTC	8.2	8.6	6.6	6.6	8.2	7.6	8.0	7.6	5.2	5.2	7.2	9.4	7.5
Sunshine Duration		0.0	6.6	6.9	6.7	7.5	0.0	3.6	7.8	6.6	6.7	5.2	3.4	2.5
Precipitation		0.1					0.0					0.1	32.4	23.7
Evaporation		1.0	0.0	0.0	0.0	1.7	2.6	1.4	0.0	0.0	0.0	6.7	4.4	11.7
Growing Degrees	5	1.8	1.1	0.0	0.0	2.9	1.8	2.6	1.1	0.0	0.0	11.3	32.9	26.7
	10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.4	5.3

2nd 10-day period (11-20/12/2015)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	8.0	5.4	8.1
Precipitation - Reference Evapotranspiration	-7.9	27.0	15.6
Number of Rainy Days	1.0	4.0	2.9
Number of Dry Days	0.0	0.0	-

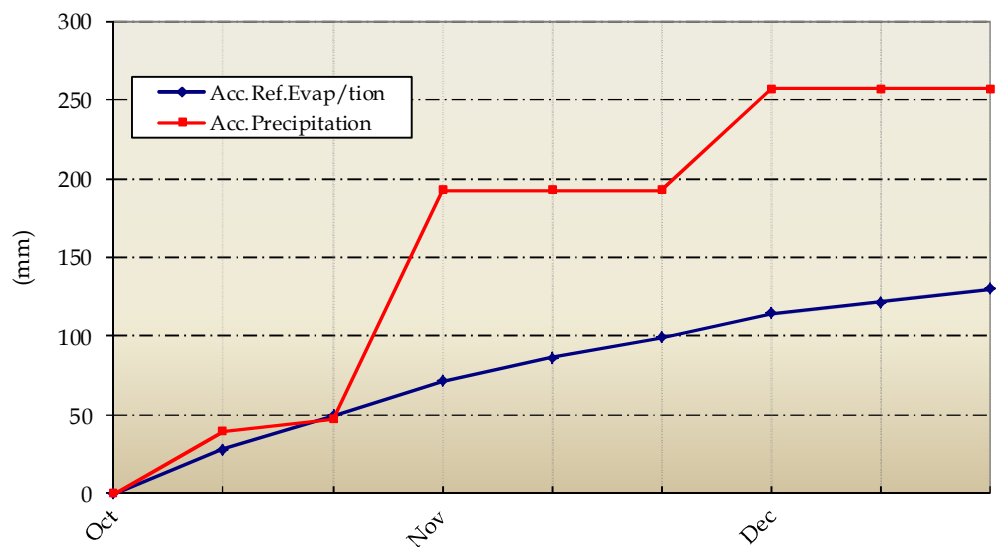
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



2nd 10-day period (11-20/12/2015)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	13.2	13.8	16.2	17.0	16.6	15.6	14.6	14.4	14.3	18.0	15.4	16.6	15.1
	Min	8.5	4.1	2.2	6.8	4.9	2.0	5.2	0.8	-0.2	4.1	3.8	7.8	6.8
Relative Humidity	Max	90	91	88	85	91	91	86	87	90	84	88	90	-
	Min	65	46	40	50	45	48	15	40	45	34	43	58	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	11.8	9.7
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	14.2	11.2
Sunshine Duration		0.0	7.4	7.4	7.5	6.0	5.6	5.0	7.6	5.4	7.6	6.0	4.8	4.1
Precipitation													75.1	43.9
Evaporation		0.5	2.5	0.5	3.5	0.5	0.0	1.0	1.0	0.5	3.0	13.0	15.0	19.6
Growing Degrees	5	5.9	4.0	4.2	6.9	5.8	3.8	4.9	2.6	2.1	6.1	46.1	71.9	59.8
	10	0.9	0.0	0.0	1.9	0.8	0.0	0.0	0.0	0.0	1.1	4.6	21.9	16.6

2nd 10-day period (11-20/12/2015)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	8.1	8.6	9.0
Precipitation - Reference Evapotranspiration	-8.1	66.5	34.9
Number of Rainy Days	0.0	4.0	4.7
Number of Dry Days	22.0	0.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

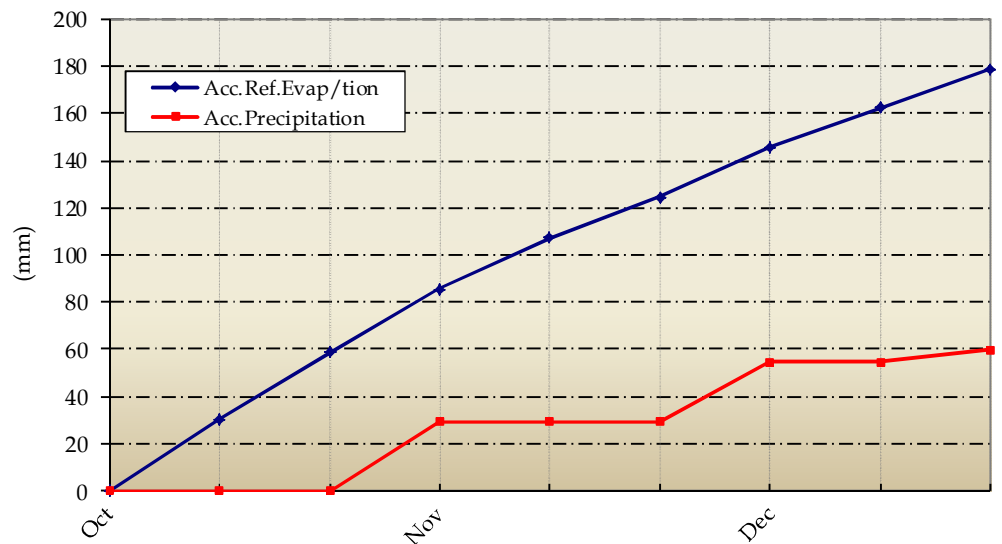


Iraklio

2nd 10-day period (11-20/12/2015)		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	13.8	15.8	17.8	16.6	16.2	14.6	14.0	15.0	15.2	15.4	17.9	16.6
	Min	14.0	11.4	13.4	10.0	11.2	12.4	13.0	13.6	13.0	13.2	12.5	12.2	10.5
Relative Humidity	Max	95	76	86	85	82	83	76	69	65	75	79	88	-
	Min	59	60	58	59	68	57	61	60	53	64	60	63	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
Sunshine Duration		0.0	0.0	4.2	7.4	1.4	0.2	0.3	0.0	0.0	0.0	1.4	3.3	3.8
Precipitation		2.0	3.3									5.3	10.4	23.4
Evaporation		2.0	4.4	2.4	3.0	2.1	1.4	3.9	2.9	1.8	0.8	24.7	18.8	25.9
Growing Degrees	5	9.6	7.6	9.6	8.9	8.9	9.3	8.8	8.8	9.0	9.2	89.7	100.8	85.7
	10	4.6	2.6	4.6	3.9	3.9	4.3	3.8	3.8	4.0	4.2	39.7	50.8	36.5

2nd 10-day period (11-20/12/2015)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	16.5	13.3	-
Precipitation - Reference Evapotranspiration	-11.2	-2.9	23.4
Number of Rainy Days	2.0	6.0	3.8
Number of Dry Days	10.0	0.0	-

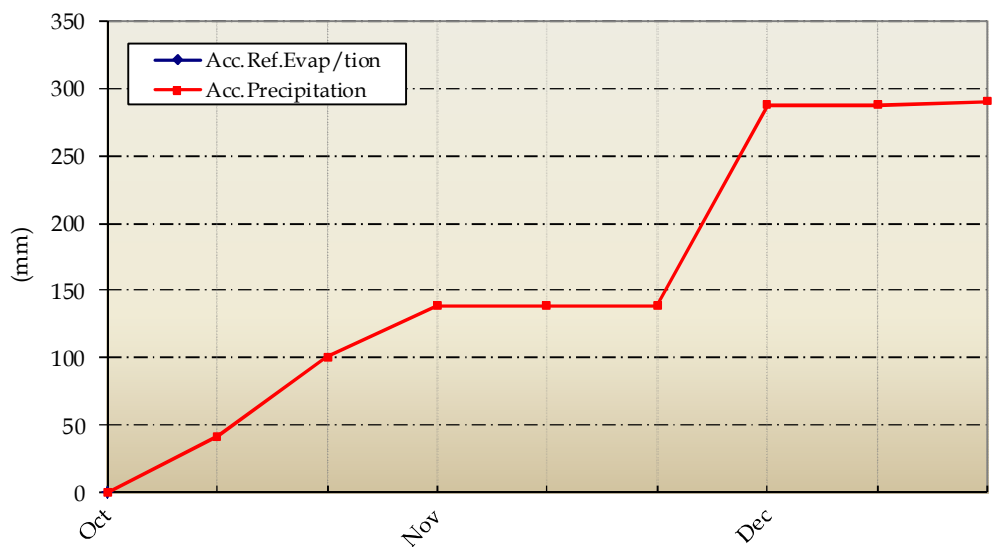
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



2nd 10-day period (11-20/12/2015)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	7.4	10.1	12.9	11.7	8.3	8.7	8.8	11.1	8.9	14.8	10.3	10.5	9.6
	Min	1.4	-3.8	-6.1	-4.3	-4.4	-6.8	6.0	-3.2	-5.6	-2.3	-2.9	1.7	1.6
Relative Humidity	Max	100	100	100	100	100	100	-	98	100	100	100	100	-
	Min	77	45	20	38	63	70	38	38	48	37	47	77	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	4.9
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	5.7
Sunshine Duration		0.0	-	5.3	4.0	2.3	1.4	-	5.9	-	5.6	3.5	-	2.5
Precipitation		0.0								2.5		2.5	26.1	54.5
Evaporation		-	-	-	-	-	-	-	-	-	-	-	-	5.5
Growing Degrees	5	0.0	0.0	0.0	0.0	0.0	0.0	2.4	0.0	0.0	1.3	3.7	16.7	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 (11-20/12/2015)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	-	-	5.7
Precipitation - Reference Evapotranspiration	-	-	48.8
Number of Rainy Days	1.0	4.0	4.4
Number of Dry Days	19.0	2.0	-

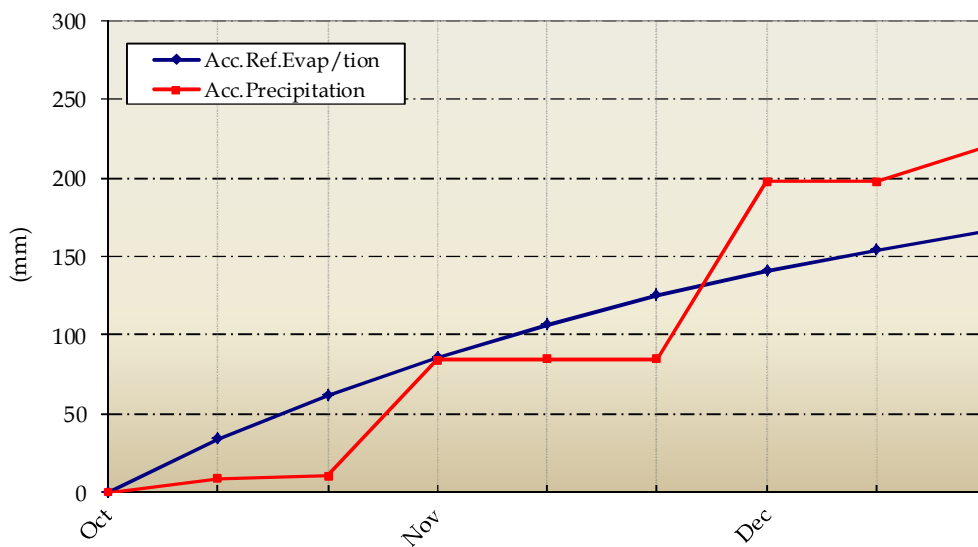
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



2nd 10-day period (11-20/12/2015)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	11.4	15.6	17.3	17.6	19.2	17.2	15.1	17.1	16.7	17.2	16.4	17.2	15.9
	Min	8.4	4.6	0.6	3.1	6.0	8.1	9.4	6.6	2.3	1.8	5.1	7.0	6.6
Relative Humidity	Max	94	87	90	92	91	79	67	85	89	90	86	92	-
	Min	78	41	42	49	48	52	33	33	28	44	45	55	-
Soil Temperature at 10 cm	06 UTC	12.0	12.0	10.6	10.6	11.0	12.0	12.0	11.0	11.0	10.4	11.3	11.8	10.6
	12 UTC	11.8	12.2	12.2	11.2	12.0	12.2	12.2	12.0	11.2	10.6	11.8	12.1	11.5
Sunshine Duration		0.2	8.0	7.9	7.0	3.5	3.1	3.6	8.3	6.4	7.7	5.6	4.3	3.9
Precipitation		21.9										21.9	43.7	53.6
Evaporation		0.4	2.6	1.0	2.6	0.6	8.8	2.0	0.8	1.2	1.4	21.4	-	23.9
Growing Degrees	5	4.9	5.1	4.0	5.4	7.6	7.7	7.3	6.9	4.5	4.5	57.7	70.9	62.3
	10	0.0	0.1	0.0	0.4	2.6	2.7	2.3	1.9	0.0	0.0	9.8	20.9	17.2

2nd 10-day period (11-20/12/2015)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	12.2	11.3	10.5
Precipitation - Reference Evapotranspiration	9.7	32.4	43.1
Number of Rainy Days	1.0	5.0	4.7
Number of Dry Days	11.0	0.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

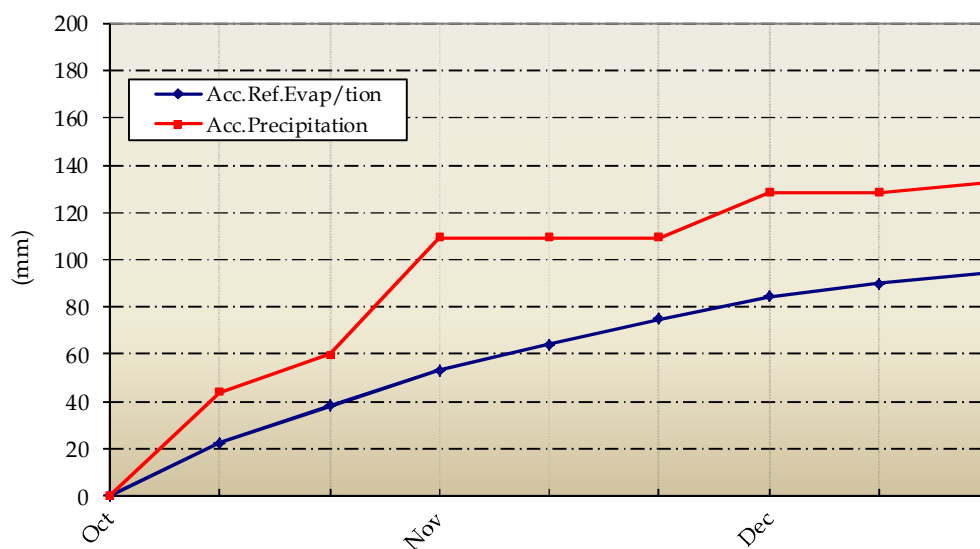


Larisa

2nd 10-day period (11-20/12/2015)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	9.6	11.2	12.7	11.2	7.6	7.8	9.7	12.2	12.2	12.2	10.6	9.6	11.0
	Min	6.2	2.8	-3.2	-3.0	-1.0	-0.8	5.4	2.6	-2.0	-3.0	0.4	5.1	1.7
Relative Humidity	Max	92	100	100	100	100	100	99	100	100	100	99	100	-
	Min	54	37	46	51	72	75	63	40	49	52	54	82	-
Soil Temperature at 10 cm	06 UTC	10.4	10.4	8.2	8.6	8.2	8.4	8.0	8.4	8.0	7.8	8.6	-	6.9
	12 UTC	10.2	10.2	11.2	8.4	7.8	7.4	8.2	7.8	7.0	7.6	8.6	-	7.3
Sunshine Duration		0.0	6.9	6.7	4.8	0.0	0.0	0.9	6.6	6.4	6.5	3.9	1.2	3.1
Precipitation								4.1				4.1	25.0	14.0
Evaporation		0.0	0.0	1.9	0.0	0.0	0.0	0.7	0.2	0.0	0.0	2.8	3.0	6.0
Growing Degrees	5	2.9	2.0	0.0	0.0	0.0	0.0	2.6	2.4	0.1	0.0	10.0	24.4	20.8
	10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	2.1

2nd 10-day period (11-20/12/2015)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	4.8	4.6	5.8
Precipitation - Reference Evapotranspiration	-0.7	20.4	8.2
Number of Rainy Days	1.0	3.0	3.3
Number of Dry Days	18.0	1.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

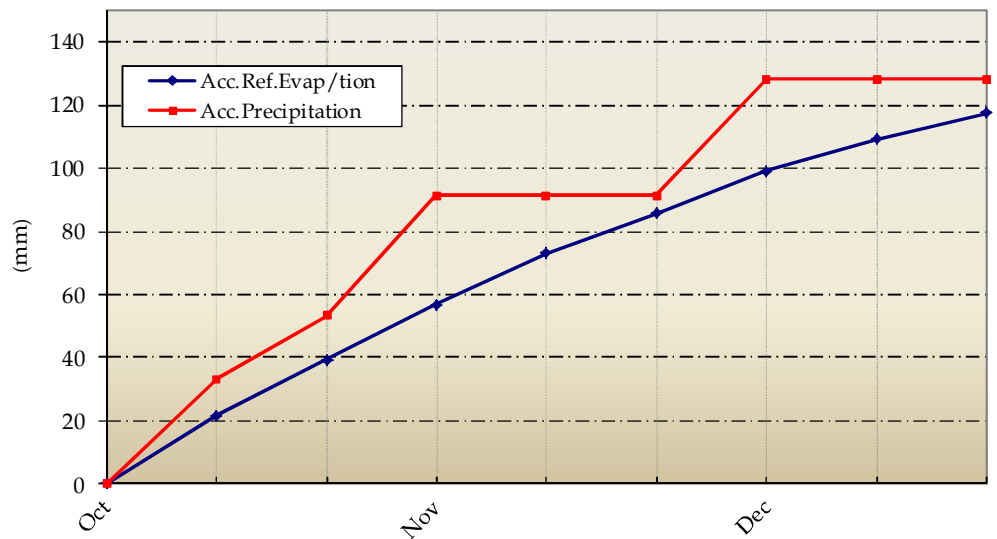


Mikra

2nd 10-day period (11-20/12/2015)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	9.1	11.0	12.0	13.6	12.1	12.0	12.7	10.6	12.7	13.2	11.9	11.5	10.6
	Min	8.0	1.2	-0.8	0.6	0.7	2.6	6.6	-0.7	-1.2	-0.2	1.7	5.6	3.0
Relative Humidity	Max	61	89	89	96	94	94	82	89	89	91	87	94	-
	Min	52	45	45	42	62	50	33	45	37	49	46	74	-
Soil Temperature at 10 cm	06 UTC	8.8	7.2	5.8	5.8	4.9	6.8	8.2	6.4	4.4	5.4	6.4	9.3	6.2
	12 UTC	9.4	8.0	8.2	7.2	7.6	8.4	9.2	7.4	7.2	7.4	8.0	10.4	7.7
Sunshine Duration		0.0	7.8	7.8	5.3	7.0	2.6	5.2	8.6	6.1	8.1	5.8	3.7	2.8
Precipitation		0.0										0.0	21.3	12.5
Evaporation		1.6	1.3	1.1	1.1	1.5	0.8	1.7	0.5	0.8	1.7	12.1	23.5	10.6
Growing Degrees	5	3.6	1.1	0.6	2.1	1.4	2.3	4.7	0.0	0.8	1.5	18.0	35.6	24.9
	10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	2.8

2nd 10-day period (11-20/12/2015)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	8.3	4.9	8.4
Precipitation - Reference Evapotranspiration	-8.3	16.4	4.1
Number of Rainy Days	0.0	2.0	2.9
Number of Dry Days	23.0	0.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

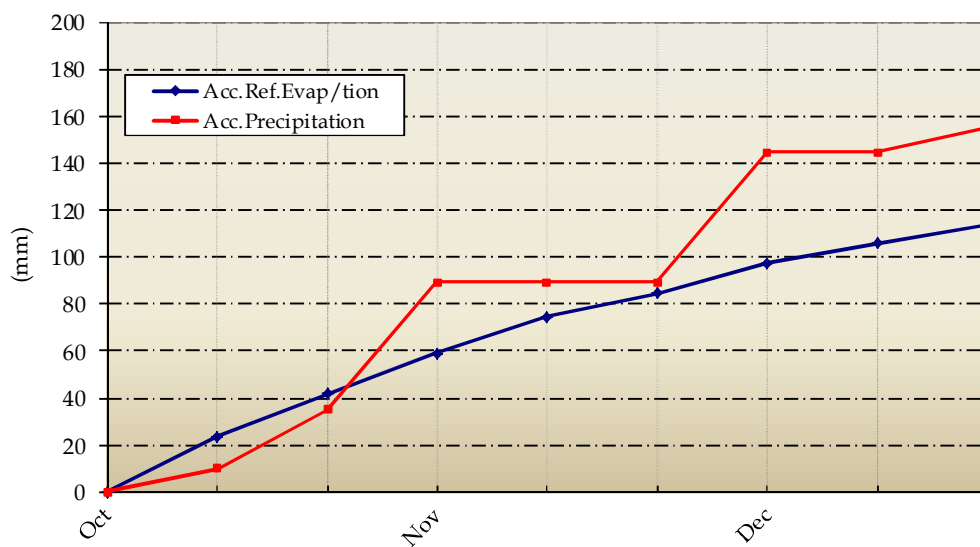


Tanagra

2nd 10-day period (11-20/12/2015)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	8.8	8.2	14.7	13.5	12.9	10.7	10.6	11.1	11.9	12.6	11.5	14.1	13.4
	Min	8.7	6.0	0.9	1.0	4.0	6.0	7.6	5.8	0.7	1.9	4.3	5.8	5.0
Relative Humidity	Max	96	98	100	100	98	97	75	86	97	99	95	100	-
	Min	71	66	43	56	58	62	58	52	50	53	57	65	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
Sunshine Duration		0.0	0.0	7.3	6.9	0.0	0.0	2.2	4.5	7.3	6.9	3.5	2.9	
Precipitation		1.4	8.5					0.3				10.2	87.7	25.9
Evaporation		1.0	2.0	0.5	1.5	1.3	1.7	3.0	3.0	2.0	0.1	16.1	12.2	
Growing Degrees	5	3.8	2.1	2.8	2.3	3.5	3.4	4.1	3.5	1.3	2.3	28.8	49.4	
	10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.9	

2nd 10-day period (11-20/12/2015)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	7.7	6.8	
Precipitation - Reference Evapotranspiration	2.5	80.9	25.9
Number of Rainy Days	3.0	3.0	4.3
Number of Dry Days	12.0	0.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

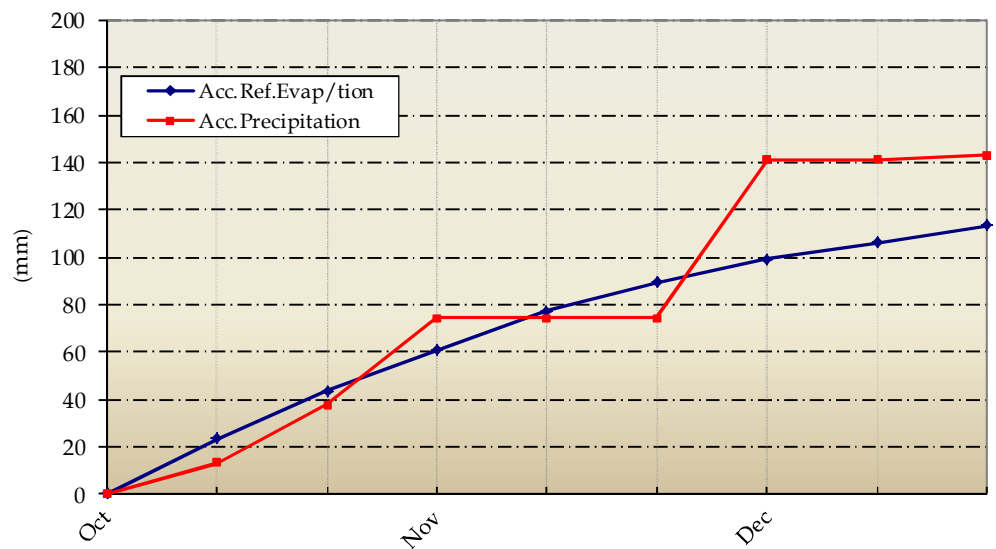


Tripoli

2nd 10-day period (11-20/12/2015)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	7.0	9.4	16.3	15.0	10.2	11.1	7.5	9.6	13.0	12.3	11.1	12.3	10.8
	Min	2.6	0.9	-4.7	-5.1	-1.9	-2.3	4.0	1.2	-5.1	-5.5	-1.6	1.5	1.8
Relative Humidity	Max	100	100	100	100	100	100	87	100	100	100	99	100	-
	Min	80	52	20	27	58	63	62	53	23	36	47	64	-
Soil Temperature at 10 cm	06 UTC	6.6	5.8	3.2	2.8	3.4	3.6	5.8	5.8	3.2	2.4	4.3	6.8	6.0
	12 UTC	7.2	-	-	5.8	5.4	6.4	6.6	7.0	-	-	6.4	8.4	6.7
Sunshine Duration		0.0	6.3	6.7	6.0	0.0	2.2	2.7	3.8	5.3	7.2	4.0	3.5	3.6
Precipitation		2.1										2.1	47.5	40.9
Evaporation		0.1	0.0	0.0	0.0	0.0	0.0	1.3	0.0	0.0	0.0	1.4	5.6	10.0
Growing Degrees	5	0.0	0.2	0.8	0.0	0.0	0.0	0.8	0.4	0.0	0.0	2.1	20.1	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 (11-20/12/2015)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	7.3	6.1	7.6
Precipitation - Reference Evapotranspiration	-5.2	41.4	33.3
Number of Rainy Days	1.0	5.0	4.3
Number of Dry Days	12.0	0.0	-

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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