



AGROMETEOROLOGICAL BULLETIN

*October 2013
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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Web addresses of HNMS
www.hnms.gr
www.emy.gov.gr
www.meteo.gov.gr
www.meteohellas.gr

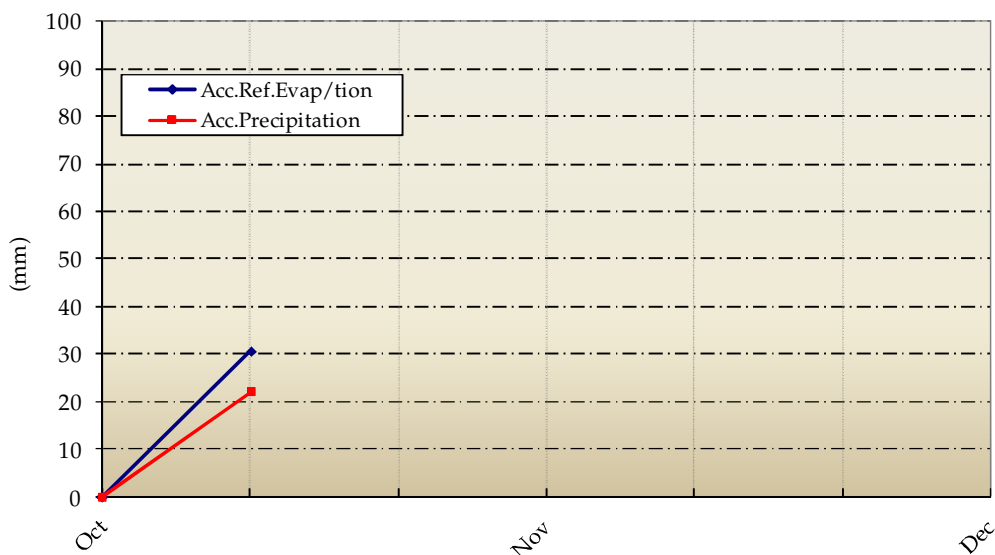
Agrinio

2nd 10-day period (11-20/10/2013)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	25.0	-	-	30.0	28.5	28.6	25.6	-	-	-	27.5	26.6	24.9
	Min	15.0	-	-	15.0	15.0	14.0	16.0	-	-	-	15.0	15.0	11.5
Relative Humidity	Max	73	-	90	82	89	91	75	-	-	88	84	95	-
	Min	65	-	55	55	65	78	36	-	-	34	55	56	-
Soil Temperature at 10 cm	06 UTC	20.0	-	-	21.0	21.0	18.0	19.2	-	-	-	19.8	21.1	17.3
	12 UTC	21.0	-	-	21.6	22.0	23.0	20.0	-	-	-	21.5	22.2	20.9
Sunshine Duration		9.5	-	9.4	9.5	7.0	1.2	10.2	-	-	10.7	8.2	6.7	6.5
Precipitation		14.0					8.0	2.0				24.0	68.2	29.2
Evaporation		-	-	4.1	3.4	1.0	7.6	-	-	-	2.9	-	28.8	33.7
Growing Degrees	5	15.0	-	-	17.5	16.8	16.3	15.8	-	-	-	-	157.9	131.9
	10	10.0	-	-	12.5	11.8	11.3	10.8	-	-	-	-	107.9	81.9

2nd 10-day period (11-20/10/2013)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	-	20.2	21.9
Precipitation - Reference Evapotranspiration	-	48.0	7.3
Number of Rainy Days	3.0	4.0	2.7
Number of Dry Days	0.0	2.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

This station is not fully operated

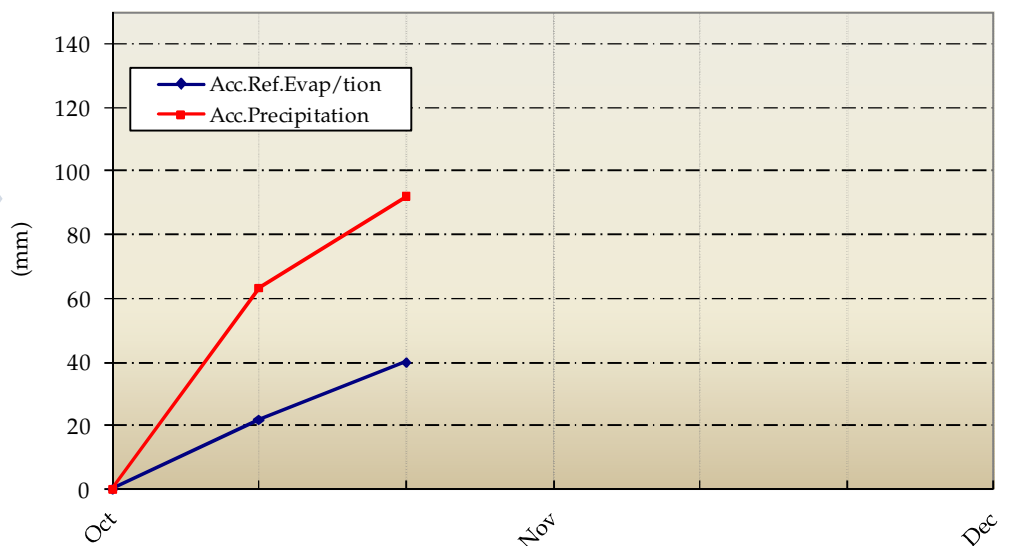


Alexandroupoli

2nd 10-day period (11-20/10/2013)		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	24.4	20.6	22.4	21.2	21.0	16.8	21.0	21.0	19.0	21.0	24.9	20.8
	Min	13.4	13.4	15.0	11.8	10.4	15.8	10.4	11.6	11.0	7.4	12.0	14.8	10.8
Relative Humidity	Max	94	98	91	96	95	96	97	95	80	92	93	89	-
	Min	71	58	65	54	61	73	75	43	32	59	59	52	-
Soil Temperature at 10 cm	06 UTC	17.4	17.4	18.4	17.0	16.8	18.6	16.8	16.0	14.0	13.4	16.6	20.6	15.2
	12 UTC	20.4	20.8	20.0	20.0	20.2	20.6	18.0	17.8	17.6	17.4	19.3	22.3	18.0
Sunshine Duration		4.6	9.2	5.9	9.0	7.8	2.1	1.5	6.4	10.1	9.7	6.6	8.8	5.9
Precipitation							10.4	16.0	2.3			28.7	0.0	15.0
Evaporation		1.6	2.2	0.9	4.7	1.8	1.2	0.5	1.8	0.7	4.5	19.9	36.9	42.1
Growing Degrees	5	13.2	13.9	12.8	12.1	10.8	13.4	8.6	11.3	11.0	8.2	115.3	148.6	107.7
	10	8.2	8.9	7.8	7.1	5.8	8.4	3.6	6.3	6.0	3.2	65.3	98.6	58.4

2nd 10-day period (11-20/10/2013)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	17.9	24.4	22.7
Precipitation - Reference Evapotranspiration	10.8	-24.4	-7.7
Number of Rainy Days	3.0	0.0	1.9
Number of Dry Days	13.0	12.0	-

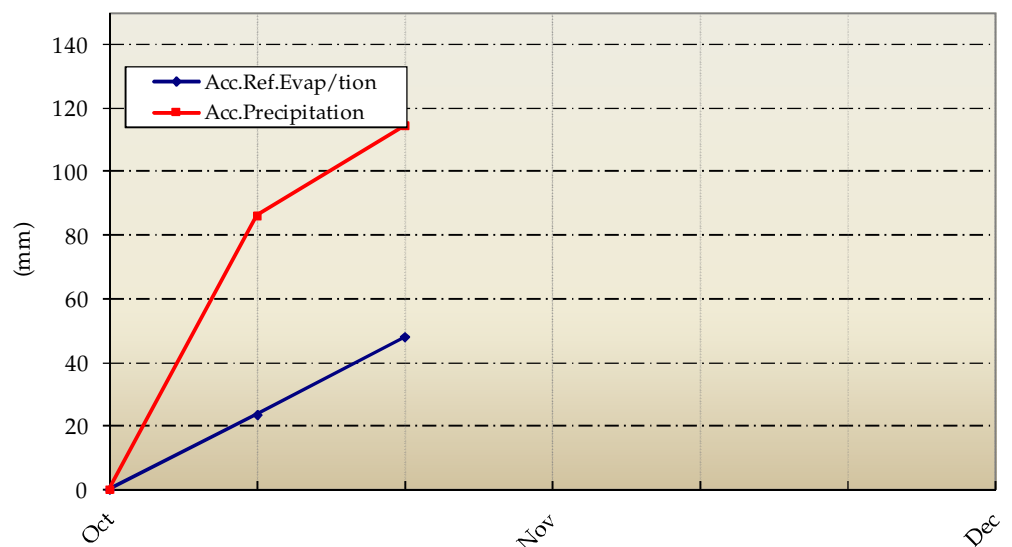
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



2nd 10-day period (11-20/10/2013)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	25.9	27.7	26.7	25.6	25.9	22.6	20.9	22.9	24.8	23.6	24.7	26.1	24.1
	Min	18.4	21.2	17.3	16.8	16.8	15.0	17.4	10.3	11.2	12.0	15.6	15.8	13.2
Relative Humidity	Max	75	91	92	93	92	92	84	89	89	91	89	92	-
	Min	61	57	59	62	58	65	43	45	34	30	51	53	-
Soil Temperature at 10 cm	06 UTC	19.4	20.6	21.0	21.2	20.6	21.4	18.4	16.2	15.6	17.2	19.2	20.6	18.6
	12 UTC	22.4	25.0	25.0	25.4	25.0	25.0	19.6	21.0	22.0	22.0	23.2	23.5	21.5
Sunshine Duration		4.4	8.8	8.8	7.3	6.3	0.9	9.1	9.6	9.6	9.3	7.4	5.7	7.1
Precipitation							28.3					28.3	54.0	23.9
Evaporation		7.9	3.4	1.8	4.4	13.2	1.8	4.8	3.5	4.0	2.2	47.0	21.5	36.4
Growing Degrees	5	17.2	19.5	17.0	16.2	16.4	13.8	14.2	11.6	13.0	12.8	151.5	159.7	136.6
	10	12.2	14.5	12.0	11.2	11.4	8.8	9.2	6.6	8.0	7.8	101.5	109.7	86.6

2nd 10-day period (11-20/10/2013)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	24.6	21.9	22.5
Precipitation - Reference Evapotranspiration	3.7	32.1	1.4
Number of Rainy Days	1.0	3.0	2.6
Number of Dry Days	5.0	27.0	-

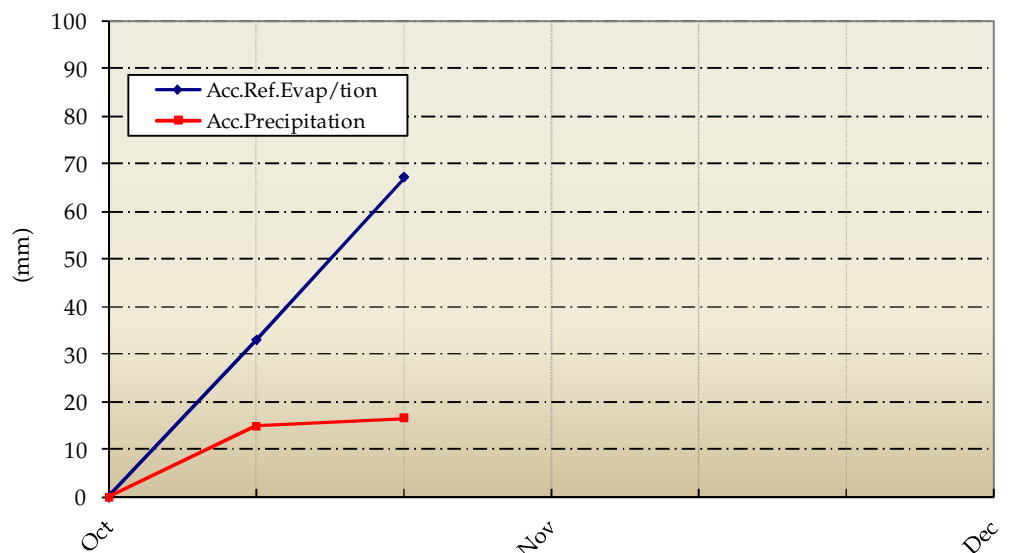
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



2nd 10-day period (11-20/10/2013)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	26.6	28.0	25.8	25.0	26.0	29.4	26.6	22.8	24.0	22.0	25.6	26.6	24.0
	Min	19.2	20.0	22.4	22.0	17.2	18.0	20.4	17.0	15.0	16.0	18.7	19.4	17.1
Relative Humidity	Max	86	78	88	76	79	86	84	81	75	78	81	88	-
	Min	50	45	59	55	42	33	34	51	56	43	47	60	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
Sunshine Duration		9.0	8.8	8.4	8.4	8.7	7.5	8.8	6.1	9.1	8.9	8.4	8.5	6.5
Precipitation								1.5	0.0			1.5		12.5
Evaporation		3.0	4.0	3.3	3.9	3.0	0.5	10.7	1.6	1.0	2.8	33.8	32.7	49.3
Growing Degrees	5	17.9	19.0	19.1	18.5	16.6	18.7	18.5	14.9	14.5	14.0	171.7	180.2	155.9
	10	12.9	14.0	14.1	13.5	11.6	13.7	13.5	9.9	9.5	9.0	121.7	130.2	105.9

2nd 10-day period (11-20/10/2013)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	34.2	31.8	-
Precipitation - Reference Evapotranspiration	-32.7	-31.8	12.5
Number of Rainy Days	1.0	0.0	1.7
Number of Dry Days	13.0	10.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

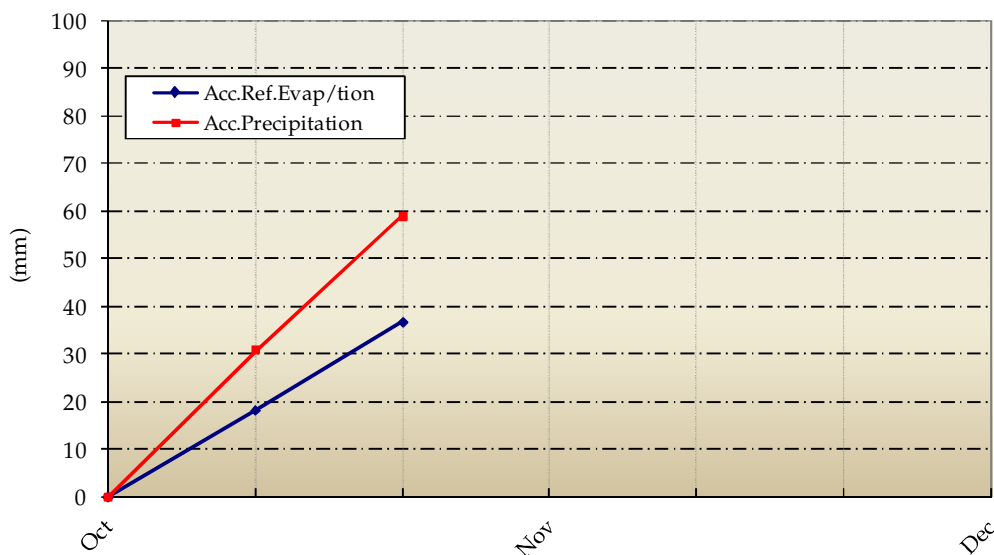


Ioannina

2nd 10-day period (11-20/10/2013)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	22.0	25.7	25.8	26.2	24.1	18.7	16.2	21.8	22.7	20.8	22.4	22.7	20.6
	Min	16.0	15.4	12.5	10.2	10.6	14.3	6.8	4.6	2.6	4.0	9.7	11.5	8.9
Relative Humidity	Max	91	98	99	98	98	97	58	96	93	96	92	96	-
	Min	70	38	42	36	49	74	42	23	38	29	44	56	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	14.0
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	16.3
Sunshine Duration		2.8	5.6	6.8	7.6	5.9	0.0	6.8	7.1	7.1	6.8	5.6	4.1	5.3
Precipitation		4.5	6.4				16.0	1.2				28.1	99.7	37.1
Evaporation		-	-	-	-	-	-	-	-	-	-	-	-	30.1
Growing Degrees	5	14.0	15.6	14.2	13.2	12.4	11.5	6.5	8.2	7.7	7.4	110.5	121.2	98.7
	10	9.0	10.6	9.2	8.2	7.4	6.5	1.5	3.2	2.7	2.4	60.5	71.2	49.1

2nd 10-day period (11-20/10/2013)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	18.6	16.5	17.6
Precipitation - Reference Evapotranspiration	9.5	83.2	19.5
Number of Rainy Days	4.0	4.0	3.4
Number of Dry Days	0.0	22.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

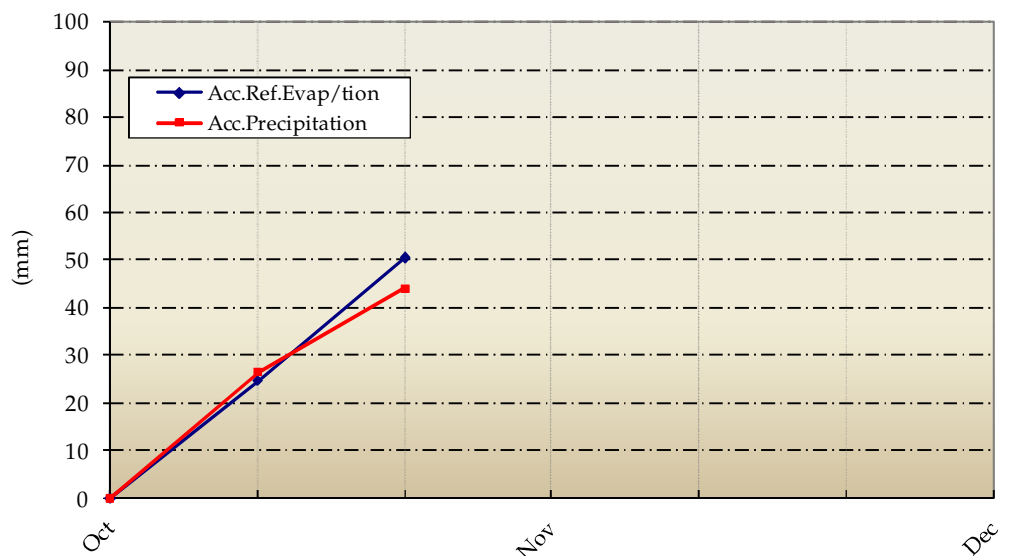


Kalamata

2nd 10-day period (11-20/10/2013)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	26.9	27.3	27.0	26.2	26.2	21.7	20.7	25.6	24.5	24.4	25.0	27.2	24.7
	Min	14.1	15.8	15.6	14.2	14.5	16.3	15.8	11.2	10.4	11.4	13.9	15.9	13.1
Relative Humidity	Max	94	95	92	93	94	94	93	90	92	90	93	92	-
	Min	60	53	52	56	56	79	44	30	42	42	51	48	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	21.1	18.6
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	22.5	20.9
Sunshine Duration		8.9	8.8	8.8	8.3	8.8	0.0	9.7	10.0	9.6	9.7	8.3	7.0	6.8
Precipitation							13.6	4.2				17.8	15.5	24.4
Evaporation		2.0	3.6	4.8	3.3	3.4	1.5	4.0	4.2	7.8	3.4	38.0	36.3	39.0
Growing Degrees	5	15.5	16.6	16.3	15.2	15.4	14.0	13.3	13.4	12.5	12.9	144.9	165.8	138.6
	10	10.5	11.6	11.3	10.2	10.4	9.0	8.3	8.4	7.5	7.9	94.9	115.8	88.6

2nd 10-day period (11-20/10/2013)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	25.8	26.5	24.3
Precipitation - Reference Evapotranspiration	-8.0	-11.0	0.1
Number of Rainy Days	2.0	3.0	2.7
Number of Dry Days	5.0	3.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

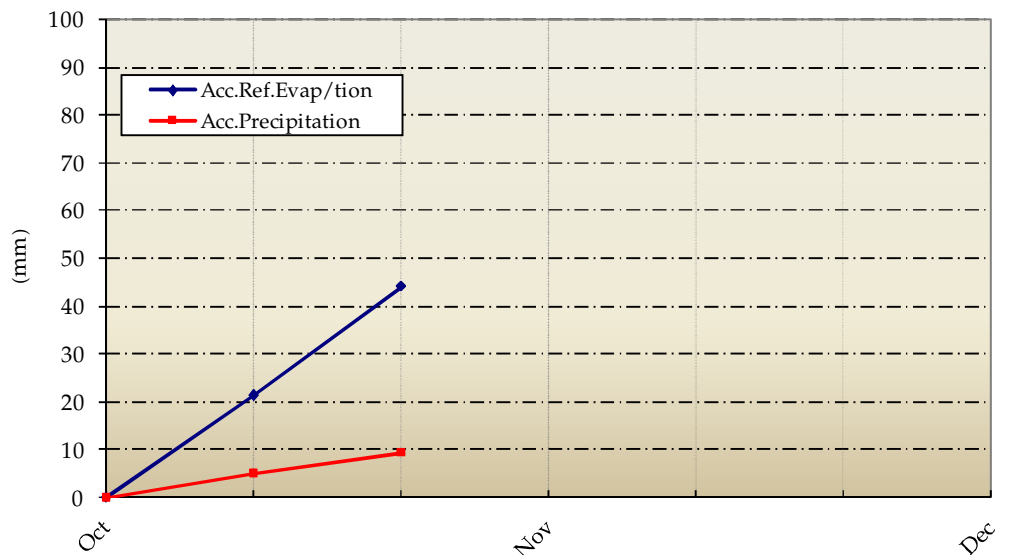


Larisa

2nd 10-day period (11-20/10/2013)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	25.4	25.8	27.2	23.8	27.0	23.4	21.4	25.6	24.2	23.6	24.7	26.6	23.0
	Min	13.6	12.4	12.8	14.2	17.8	14.5	14.1	11.5	6.6	6.8	12.4	13.0	10.1
Relative Humidity	Max	97	98	100	100	86	97	69	70	74	87	88	96	-
	Min	43	48	50	56	42	41	26	17	20	27	37	41	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	20.4	17.2
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	21.5	18.6
Sunshine Duration		5.5	1.6	7.4	0.0	5.6	4.2	7.8	7.6	7.5	7.4	5.5	5.9	5.6
Precipitation		2.1					2.1					4.2	12.9	14.1
Evaporation		1.8	2.6	3.6	7.7	0.4	1.9	4.6	3.9	5.3	4.5	36.3	34.9	31.3
Growing Degrees	5	14.5	14.1	15.0	14.0	17.4	14.0	12.8	13.6	10.4	10.2	135.9	148.1	115.6
	10	9.5	9.1	10.0	9.0	12.4	9.0	7.8	8.6	5.4	5.2	85.9	98.1	65.8

2nd 10-day period (11-20/10/2013)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	22.9	21.7	20.6
Precipitation - Reference Evapotranspiration	-18.7	-8.8	-6.5
Number of Rainy Days	2.0	4.0	2.4
Number of Dry Days	1.0	0.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

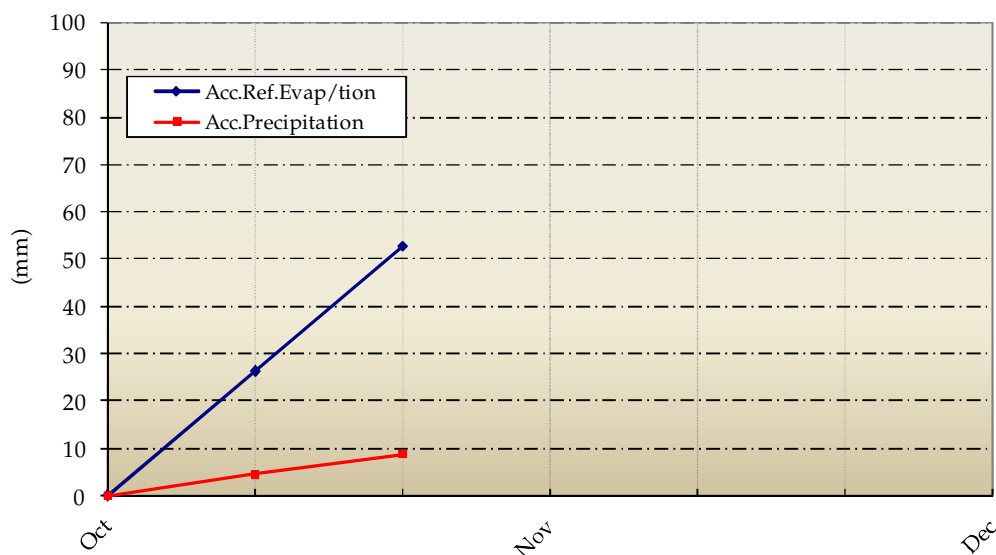


Mikra

2nd 10-day period (11-20/10/2013)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	20.6	24.2	24.8	22.1	23.8	23.2	19.8	20.9	22.8	22.0	22.4	25.0	21.6
	Min	14.2	15.0	14.6	19.4	17.4	14.5	14.0	16.0	15.2	10.4	15.1	14.4	11.6
Relative Humidity	Max	92	93	93	85	85	89	59	57	69	81	80	85	-
	Min	78	57	57	67	50	51	48	32	28	40	51	48	-
Soil Temperature at 10 cm	06 UTC	19.0	18.6	18.8	21.2	20.4	19.2	18.0	17.0	16.6	16.4	18.5	19.8	16.5
	12 UTC	20.2	22.6	23.2	22.4	22.4	22.4	18.6	19.4	20.0	20.2	21.1	24.3	19.4
Sunshine Duration		2.8	2.8	0.6	0.0	2.3	3.1	6.2	9.3	9.4	8.7	4.5	7.3	5.3
Precipitation		4.3						0.0				4.3	6.2	13.0
Evaporation		1.0	0.1	3.2	0.7	6.0	3.2	7.8	8.0	4.4	3.0	37.4	40.1	31.8
Growing Degrees	5	12.4	14.6	14.7	15.8	15.6	13.9	11.9	13.5	14.0	11.2	137.5	147.5	116.2
	10	7.4	9.6	9.7	10.8	10.6	8.9	6.9	8.5	9.0	6.2	87.5	97.5	66.2

2nd 10-day period (11-20/10/2013)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	26.4	22.9	20.4
Precipitation - Reference Evapotranspiration	-22.1	-16.7	-7.4
Number of Rainy Days	1.0	2.0	2.0
Number of Dry Days	7.0	24.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

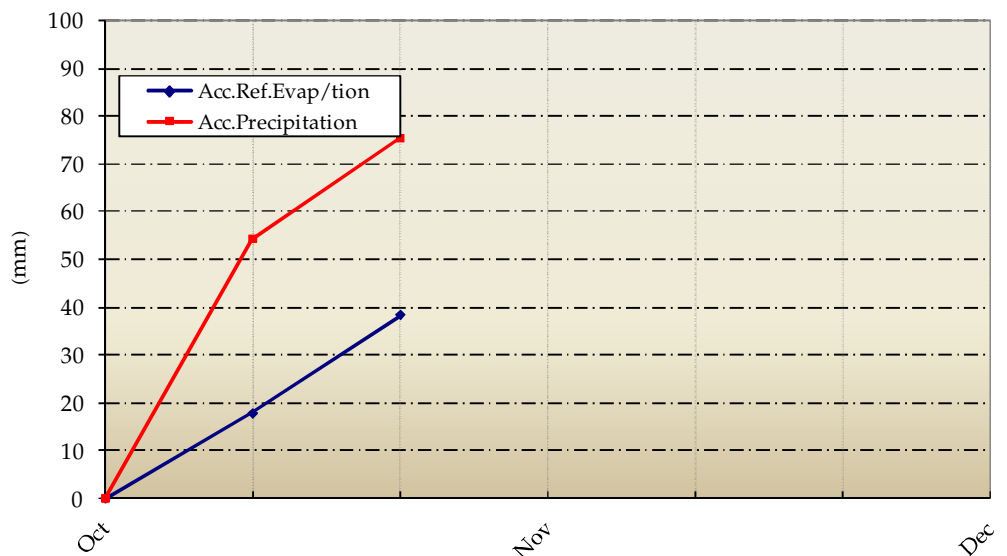


Tripoli

2nd 10-day period (11-20/10/2013)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	25.2	27.8	28.7	28.2	27.7	18.4	16.5	21.1	20.7	19.4	23.4	24.5	21.3
	Min	9.6	10.2	10.2	10.4	9.3	11.7	9.9	4.2	4.3	4.2	8.4	10.4	8.2
Relative Humidity	Max	96	95	90	95	97	96	63	95	98	98	92	94	-
	Min	45	31	65	25	26	63	38	32	35	97	46	43	-
Soil Temperature at 10 cm	06 UTC	13.8	15.4	15.8	16.2	16.2	16.4	14.4	12.0	12.2	12.6	14.5	16.8	15.5
	12 UTC	19.4	20.6	-	21.4	21.4	17.2	17.0	17.2	17.4	-	19.0	21.1	17.2
Sunshine Duration		8.7	8.4	8.4	8.5	8.5	0.5	9.2	8.8	8.5	8.6	7.8	6.4	6.8
Precipitation							8.9	12.4				21.3	22.4	15.9
Evaporation		2.8	2.9	2.9	2.6	4.6	0.0	0.0	2.6	2.0	2.3	22.7	17.7	28.1
Growing Degrees	5	12.4	14.0	14.5	14.3	13.5	10.1	8.2	7.7	7.5	6.8	108.9	124.4	97.5
	10	7.4	9.0	9.5	9.3	8.5	5.1	3.2	2.7	2.5	1.8	58.9	74.4	48.2

2nd 10-day period (11-20/10/2013)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	20.6	19.3	21.4
Precipitation - Reference Evapotranspiration	0.7	3.1	-5.5
Number of Rainy Days	2.0	4.0	2.7
Number of Dry Days	5.0	6.0	-

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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