

AGROMETEOROLOGICAL BULLETIN

October 2010
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



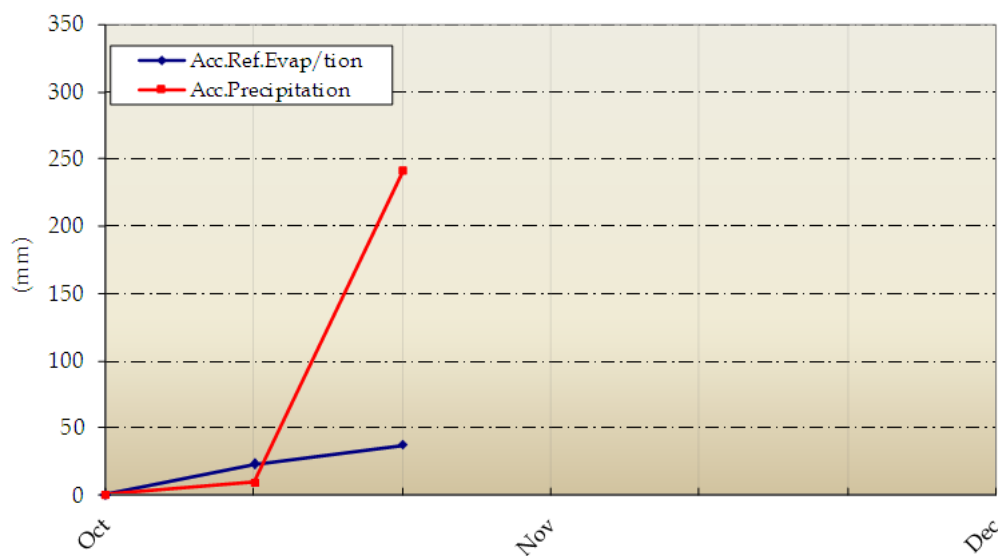
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www.hnms.gr
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2nd 10-day period (11-20/10/2010)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	20.0	23.0	23.4	23.4	22.0	20.4	19.4	21.0	22.0	22.4	21.7	-	24.9
	Min	10.0	16.0	17.0	16.6	13.0	14.8	14.6	13.8	15.2	14.8	14.6	-	11.5
Relative Humidity	Max	95	98	96	98	100	98	98	98	93	96	97	-	-
	Min	82	81	75	75	69	81	84	73	53	58	73	-	-
Soil Temperature at 10 cm	06 UTC	19.0	19.2	20.8	20.8	19.0	18.8	18.8	18.2	17.8	17.2	19.0	-	17.3
	12 UTC	19.8	20.2	21.4	20.2	20.6	19.4	19.2	18.8	19.0	19.4	19.8	-	20.9
Sunshine Duration		0.0	0.5	0.0	1.9	3.4	2.2	0.0	0.0	5.7	5.1	1.9	-	6.5
Precipitation		4.6	14.1	0.8	81.3	29.7	20.4	16.5	5.7	42.9	16.6	232.6	-	29.2
Evaporation		2.5	-	4.0	2.6	1.2	1.4	0.4	0.3	2.2	0.9	-	-	33.7
Growing Degrees	5	10.0	14.5	15.2	15.0	12.5	12.6	12.0	12.4	13.6	13.6	131.4	-	131.9
	10	5.0	9.5	10.2	10.0	7.5	7.6	7.0	7.4	8.6	8.6	81.4	-	81.9

2nd 10-day period (11-20/10/2010)	Previous Year Value	Past Years Mean Value	
Reference Evapotranspiration	14.4	-	21.9
Precipitation - Reference Evapotranspiration	218.2	-	7.3
Number of Rainy Days	10.0	-	2.7
Number of Dry Days	0.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

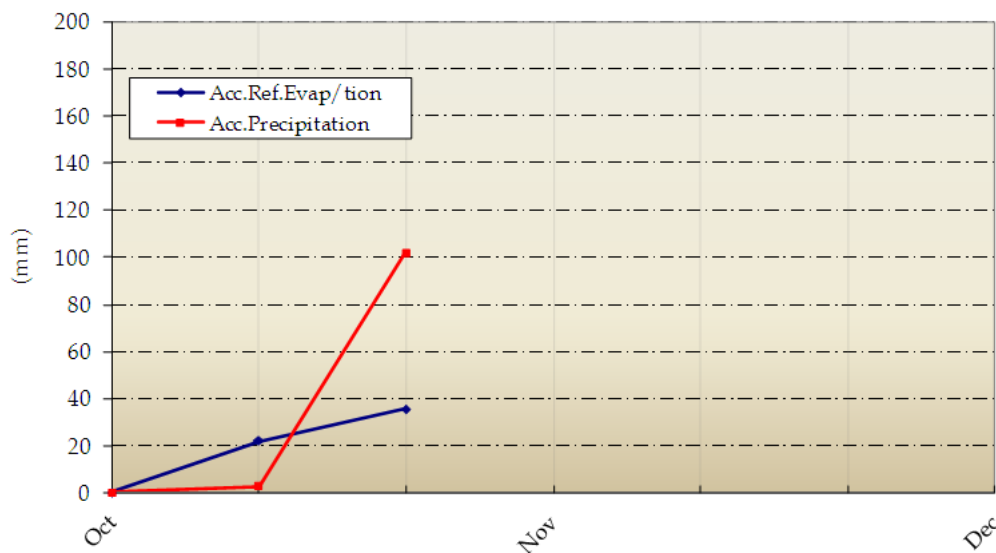


Alexandroupoli

2nd 10-day period (11-20/10/2010)		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	15.6	17.0	17.0	15.8	18.6	21.4	18.4	21.8	21.6	18.5	20.1	20.8
	Min	5.6	13.0	14.0	14.0	14.0	13.8	12.2	15.8	16.4	19.2	13.8	12.4	10.8
Relative Humidity	Max	98	98	98	100	98	98	98	98	98	94	98	91	-
	Min	49	89	83	88	87	77	72	90	67	69	77	58	-
Soil Temperature at 10 cm	06 UTC	14.6	16.0	15.8	16.0	15.0	15.2	15.0	16.6	16.8	17.6	15.9	17.0	15.2
	12 UTC	17.0	16.0	16.4	16.6	16.4	16.0	16.6	17.0	18.4	19.0	16.9	18.6	18.0
Sunshine Duration		5.1	0.0	0.0	1.0	0.0	1.2	5.8	0.0	8.9	6.2	2.8	5.1	5.9
Precipitation		0.1	8.1	4.6	15.9	18.6			50.6	0.8	0.4	99.1	35.7	15.0
Evaporation		2.2	0.0	0.0	0.6	0.0	1.0	2.5	0.9	4.4	2.0	13.6	21.9	42.1
Growing Degrees	5	6.8	9.3	10.5	10.5	9.9	11.2	11.8	12.1	14.1	15.4	111.6	112.6	107.7
	10	1.8	4.3	5.5	5.5	4.9	6.2	6.8	7.1	9.1	10.4	61.6	62.6	58.4

2nd 10-day period (11-20/10/2010)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	13.6	19.4	22.7
Precipitation - Reference Evapotranspiration	85.5	16.3	-7.7
Number of Rainy Days	8.0	4.0	1.9
Number of Dry Days	0.0	8.0	-

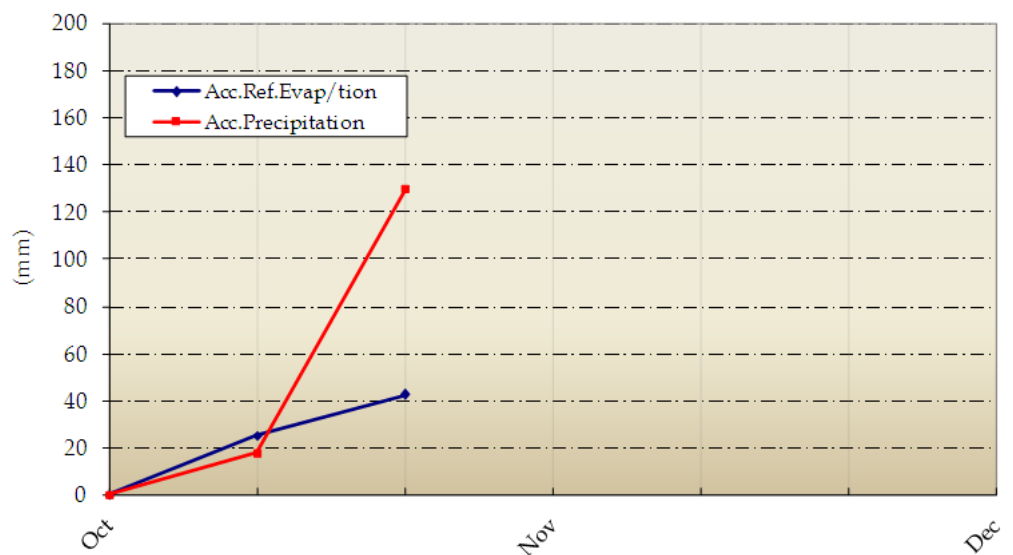
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



2nd 10-day period (11-20/10/2010)		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	24.4	27.6	24.8	24.0	23.8	19.0	22.6	21.8	23.2	23.3	21.5	24.1
	Min	14.0	17.8	18.8	19.4	16.0	15.6	16.6	15.2	15.4	15.0	16.4	14.5	13.2
Relative Humidity	Max	96	98	94	92	96	96	94	100	91	96	95	96	-
	Min	61	74	67	70	60	68	80	67	57	52	66	59	-
Soil Temperature at 10 cm	06 UTC	17.2	18.8	19.8	20.6	19.2	19.0	19.0	17.8	17.6	17.6	18.7	18.2	18.6
	12 UTC	19.2	21.2	22.4	22.8	22.2	21.6	19.0	19.6	20.2	21.2	20.9	21.2	21.5
Sunshine Duration		0.0	0.7	1.4	3.4	5.3	3.8	0.0	0.3	4.7	7.1	2.7	5.2	7.1
Precipitation		0.1	13.2	1.5	8.9		8.7	35.6	10.9	18.7	14.5	112.1	87.8	23.9
Evaporation		1.1	4.5	9.0	2.5	0.8	2.1	1.6	2.5	3.8	6.3	34.2	25.7	36.4
Growing Degrees	5	12.7	16.1	18.2	17.1	15.0	14.7	12.8	13.9	13.6	14.1	148.2	129.8	136.6
	10	7.7	11.1	13.2	12.1	10.0	9.7	7.8	8.9	8.6	9.1	98.2	79.8	86.6

2nd 10-day period (11-20/10/2010)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	17.2	19.5	22.5
Precipitation - Reference Evapotranspiration	94.9	68.3	1.4
Number of Rainy Days	9.0	8.0	2.6
Number of Dry Days	0.0	8.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

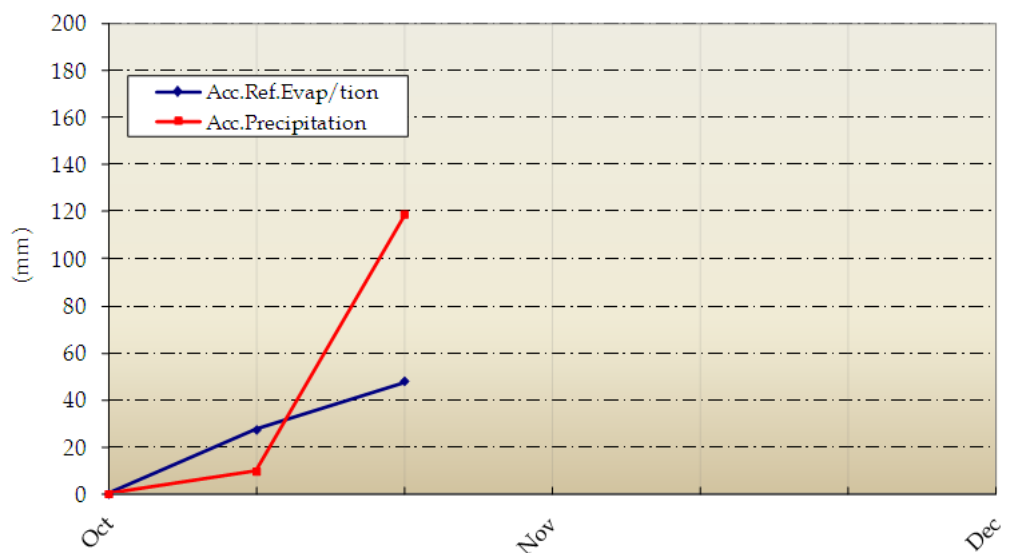


Kalamata

2nd 10-day period (11-20/10/2010)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	23.8	26.4	30.2	27.2	26.2	24.6	23.0	19.4	23.0	22.4	24.6	21.8	24.7
	Min	13.2	18.6	18.0	18.8	15.0	13.6	13.4	16.0	15.2	13.2	15.5	13.0	13.1
Relative Humidity	Max	98	96	94	96	98	98	98	98	96	98	97	97	-
	Min	54	67	58	54	49	53	67	91	54	70	62	60	-
Soil Temperature at 10 cm	06 UTC	19.4	19.8	21.0	21.6	20.6	20.4	20.0	19.4	19.2	18.6	20.0	18.6	18.6
	12 UTC	21.6	21.6	22.0	22.4	22.0	21.2	20.8	19.8	19.6	19.4	21.0	20.1	20.9
Sunshine Duration		4.3	1.4	2.3	6.6	8.4	7.6	3.3	0.0	7.3	5.1	4.6	6.3	6.8
Precipitation		0.3		0.0	1.5		0.8	50.8	39.3	9.2	7.5	109.4	72.8	24.4
Evaporation		2.3	1.0	7.7	1.2	3.2	3.3	4.7	7.2	0.1	2.1	32.8	34.3	39.0
Growing Degrees	5	13.5	17.5	19.1	18.0	15.6	14.1	13.2	12.7	14.1	12.8	150.6	124.0	138.6
	10	8.5	12.5	14.1	13.0	10.6	9.1	8.2	7.7	9.1	7.8	100.6	74.0	88.6

2nd 10-day period (11-20/10/2010)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	20.3	19.2	24.3
Precipitation - Reference Evapotranspiration	89.1	53.6	0.1
Number of Rainy Days	7.0	8.0	2.7
Number of Dry Days	0.0	8.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

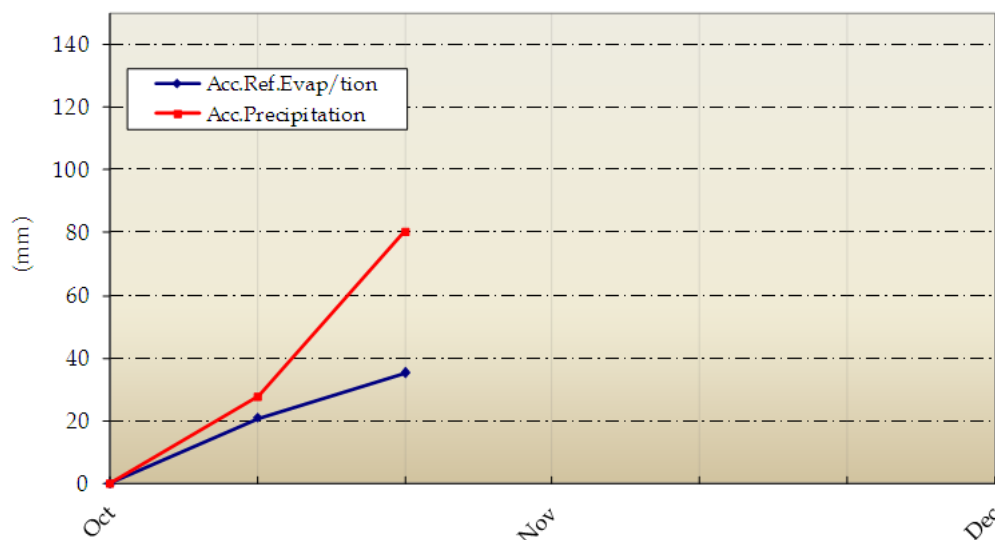


Larisa

2nd 10-day period (11-20/10/2010)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	15.4	15.6	18.2	18.8	22.0	22.2	21.2	20.2	23.0	24.0	20.1	21.2	23.0
	Min	12.8	12.2	14.6	15.6	13.0	15.2	13.4	14.0	14.0	10.8	13.6	11.0	10.1
Relative Humidity	Max	98	100	100	100	100	96	95	98	100	92	98	89	-
	Min	68	93	86	86	73	60	70	71	40	51	70	45	-
Soil Temperature at 10 cm	06 UTC	16.8	16.4	16.2	18.0	14.6	18.0	18.2	14.4	18.0	17.4	16.8	18.0	17.2
	12 UTC	17.0	17.0	16.8	17.6	18.6	19.2	19.6	19.8	18.4	18.8	18.3	19.5	18.6
Sunshine Duration		0.0	0.0	0.0	0.5	4.7	3.0	3.4	1.4	6.0	7.7	2.7	4.7	5.6
Precipitation		10.3	20.0	0.6	18.5	1.2	0.1	0.3		1.5	0.2	52.7	8.0	14.1
Evaporation		2.5	0.6	-	0.0	0.3	1.5	0.1	1.5	1.2	5.4	-	28.0	31.3
Growing Degrees	5	9.1	8.9	11.4	12.2	12.5	13.7	12.3	12.1	13.5	12.4	118.1	111.0	115.6
	10	4.1	3.9	6.4	7.2	7.5	8.7	7.3	7.1	8.5	7.4	68.1	61.0	65.8

2nd 10-day period (11-20/10/2010)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	14.3	20.9	20.6
Precipitation - Reference Evapotranspiration	38.4	-12.9	-6.5
Number of Rainy Days	9.0	3.0	2.4
Number of Dry Days	2.0	11.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

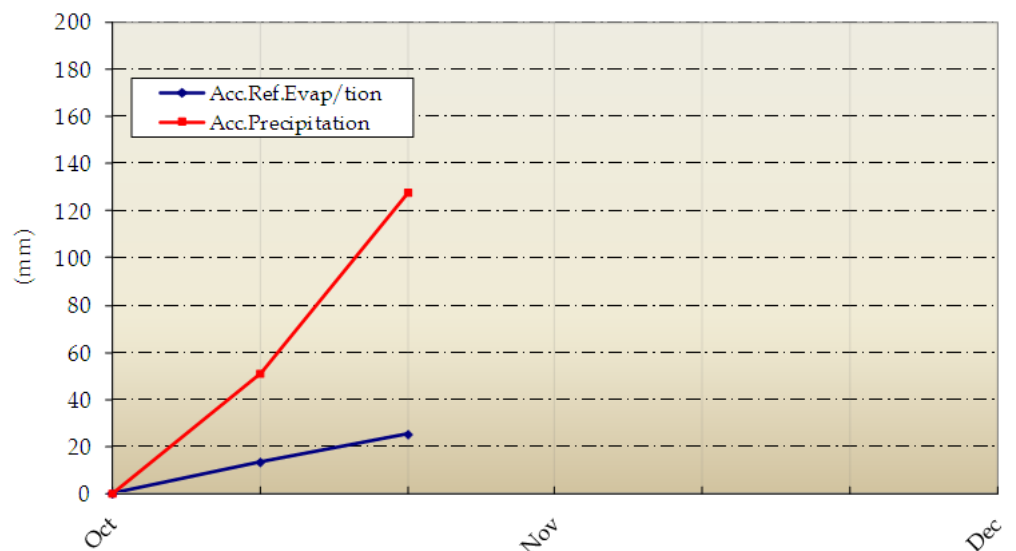


Series

2nd 10-day period (11-20/10/2010)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	14.2	13.6	15.4	18.8	19.2	19.4	23.0	20.0	26.0	23.8	19.3	19.6	22.1
	Min	4.8	10.2	13.2	15.2	15.2	14.6	-	15.2	16.0	12.8	13.0	9.3	10.0
Relative Humidity	Max	95	95	96	96	96	-	96	95	83	95	94	86	-
	Min	61	94	95	81	74	-	64	74	32	44	69	52	-
Soil Temperature at 10 cm	06 UTC	12.8	14.0	15.2	15.6	16.4	16.6	-	17.0	17.6	17.2	15.8	16.5	15.4
	12 UTC	14.0	-	15.6	16.2	17.0	17.2	-	17.2	19.0	-	16.6	17.3	17.7
Sunshine Duration		0.6	0.0	0.0	0.0	0.6	-	4.1	0.9	6.7	2.4	1.7	3.8	5.7
Precipitation		3.0	16.6	7.4	22.2	14.2	1.0		4.6	7.2		76.2	21.6	13.5
Evaporation		0.2	0.0	0.0	0.0	0.4	-	4.2	1.1	2.2	1.0	-	20.4	24.0
Growing Degrees	5	4.5	6.9	9.3	12.0	12.2	12.0	-	12.6	16.0	13.3	-	94.5	109.9
	10	0.0	1.9	4.3	7.0	7.2	7.0	-	7.6	11.0	8.3	-	47.3	60.3

2nd 10-day period (11-20/10/2010)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	11.8	14.5	15.0
Precipitation - Reference Evapotranspiration	64.4	7.1	-1.5
Number of Rainy Days	8.0	4.0	2.0
Number of Dry Days	2.0	9.0	-

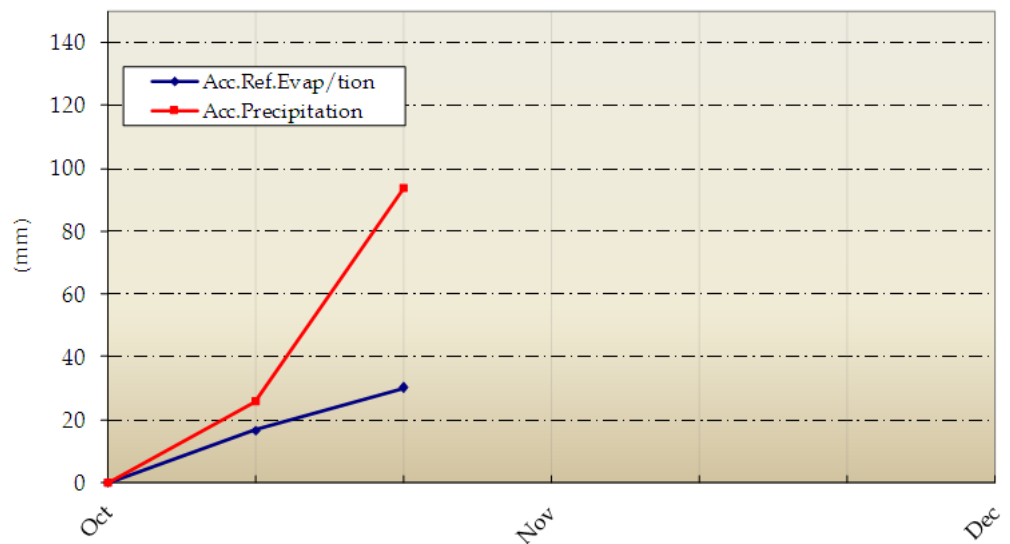
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



2nd 10-day period (11-20/10/2010)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	13.6	15.2	16.6	18.6	20.8	22.0	-	22.8	28.4	24.6	20.3	20.4	22.4
	Min	6.0	9.8	14.0	15.4	14.8	14.4	-	16.0	16.2	12.4	13.2	9.9	10.0
Relative Humidity	Max	99	95	96	98	95	-	95	96	94	96	96	92	-
	Min	75	91	95	94	63	-	45	61	26	38	65	44	-
Soil Temperature at 10 cm	06 UTC	14.0	14.4	15.8	16.6	16.8	17.2	-	18.0	18.4	17.8	16.6	16.9	17.1
	12 UTC	15.0	15.2	16.2	17.2	18.2	18.4	-	19.2	19.6	18.6	17.5	19.0	17.9
Sunshine Duration		0.0	0.0	0.0	0.0	3.0	-	4.4	1.4	6.8	5.3	2.3	4.9	5.6
Precipitation		4.0	25.2	14.4	12.6		3.1		0.8	8.1		68.2	11.9	9.2
Evaporation		1.6	0.7	0.2	0.8	0.9	-	1.0	0.8	2.2	1.0	-	19.4	23.7
Growing Degrees	5	4.8	7.5	10.3	12.0	12.8	13.2	-	14.4	17.3	13.5	-	101.5	111.4
	10	0.0	2.5	5.3	7.0	7.8	8.2	-	9.4	12.3	8.5	-	51.5	61.7

2nd 10-day period (11-20/10/2010)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	13.4	21.0	17.0
Precipitation - Reference Evapotranspiration	54.8	-9.1	-7.8
Number of Rainy Days	7.0	4.0	1.6
Number of Dry Days	2.0	9.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

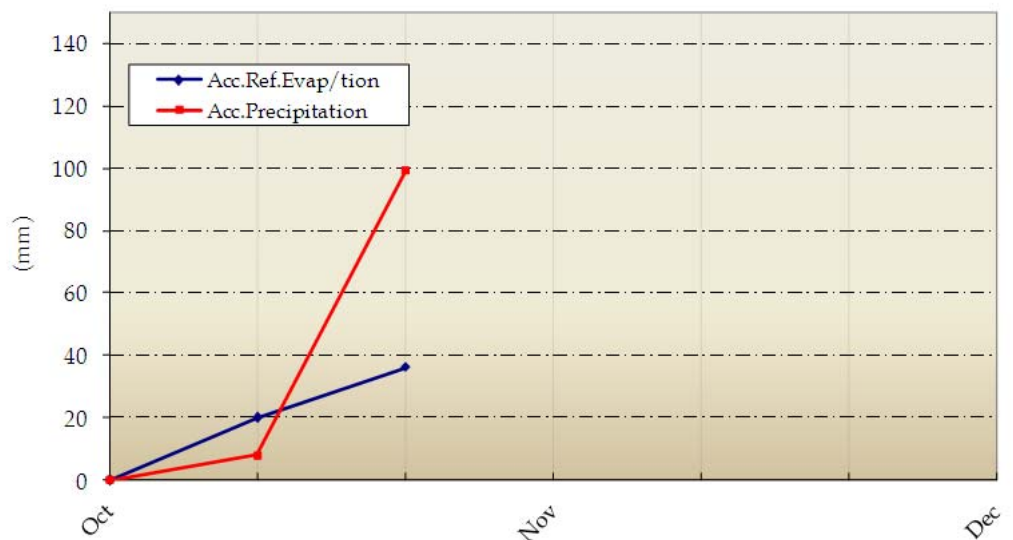


Tripoli

2nd 10-day period (11-20/10/2010)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	17.4	24.2	26.8	21.2	22.4	21.6	21.6	15.4	17.8	19.6	20.8	-	21.3
	Min	10.4	14.8	13.2	15.0	12.4	10.2	10.2	13.0	12.4	10.6	12.2	-	8.2
Relative Humidity	Max	97	98	100	98	93	98	95	98	86	98	96	-	-
	Min	76	64	48	73	56	59	53	95	61	60	64	-	-
Soil Temperature at 10 cm	06 UTC	15.2	17.0	17.2	18.0	15.6	15.2	15.2	15.8	14.8	14.0	15.8	-	15.5
	12 UTC	18.0	20.2	20.2	20.0	19.4	19.0	19.0	16.8	17.8	17.0	18.7	-	17.2
Sunshine Duration		0.6	2.6	3.8	3.7	7.8	6.4	3.7	0.0	6.8	5.7	4.1	-	6.8
Precipitation		2.7	0.3	0.2	13.1		11.6	12.2	38.5	5.8	6.7	91.1	-	15.9
Evaporation		0.2	2.0	2.1	1.0	2.0	1.6	0.8	0.7	2.6	1.5	14.5	-	28.1
Growing Degrees	5	8.9	14.5	15.0	13.1	12.4	10.9	10.9	9.2	10.1	10.1	115.1	-	97.5
	10	3.9	9.5	10.0	8.1	7.4	5.9	5.9	4.2	5.1	5.1	65.1	-	48.2

2nd 10-day period (11-20/10/2010)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	16.3	-	21.4
Precipitation - Reference Evapotranspiration	74.8	-	-5.5
Number of Rainy Days	9.0	-	2.7
Number of Dry Days	0.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

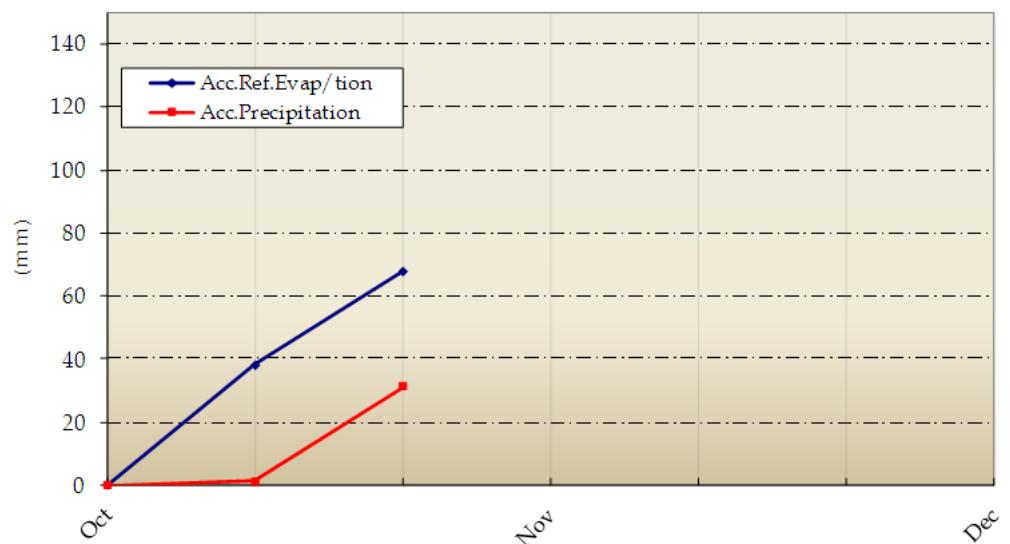


Tympaki

2nd 10-day period (11-20/10/2010)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	27.6	32.0	30.6	29.6	25.0	26.0	26.0	26.8	25.8	24.6	27.4	25.9	25.4
	Min	16.4	18.2	23.2	23.8	19.4	17.8	17.6	20.6	20.0	18.4	19.5	16.4	15.2
Relative Humidity	Max	80	70	77	87	96	89	89	93	88	90	86	95	-
	Min	42	22	39	24	69	50	43	49	47	42	43	51	-
Soil Temperature at 10 cm	06 UTC	22.0	23.2	25.8	26.0	25.0	22.6	22.8	23.2	23.0	21.8	23.5	22.3	21.8
	12 UTC	26.6	28.0	29.2	28.0	26.4	27.0	27.4	24.6	26.8	24.2	26.8	26.7	25.4
Sunshine Duration		7.8	4.0	1.6	0.0	4.8	8.1	4.1	2.1	6.4	6.4	4.5	5.9	7.7
Precipitation					0.1	19.4		0.3	2.6	1.0	6.6	30.0	1.0	5.8
Evaporation		4.1	5.5	5.3	4.4	1.6	5.7	1.6	4.8	6.4	5.1	44.5	51.6	54.1
Growing Degrees	5	17.0	20.1	21.9	21.7	17.2	16.9	16.8	18.7	17.9	16.5	184.7	161.6	152.5
	10	12.0	15.1	16.9	16.7	12.2	11.9	11.8	13.7	12.9	11.5	134.7	111.6	102.5

2nd 10-day period (11-20/10/2010)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	29.8	23.5	29.5
Precipitation - Reference Evapotranspiration	0.2	-22.5	-23.7
Number of Rainy Days	6.0	3.0	1.2
Number of Dry Days	6.0	19.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration





◆ List of Symbols and Abbreviations

Reference Evapotranspiration ET_0 (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.

Mesurements 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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