



AGROMETEOROLOGICAL BULLETIN

November 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



Hellenic National Meteorological Service
Division of Climatology-Applications
El. Venizelou Street 14, 16777
Helliniko, Athens

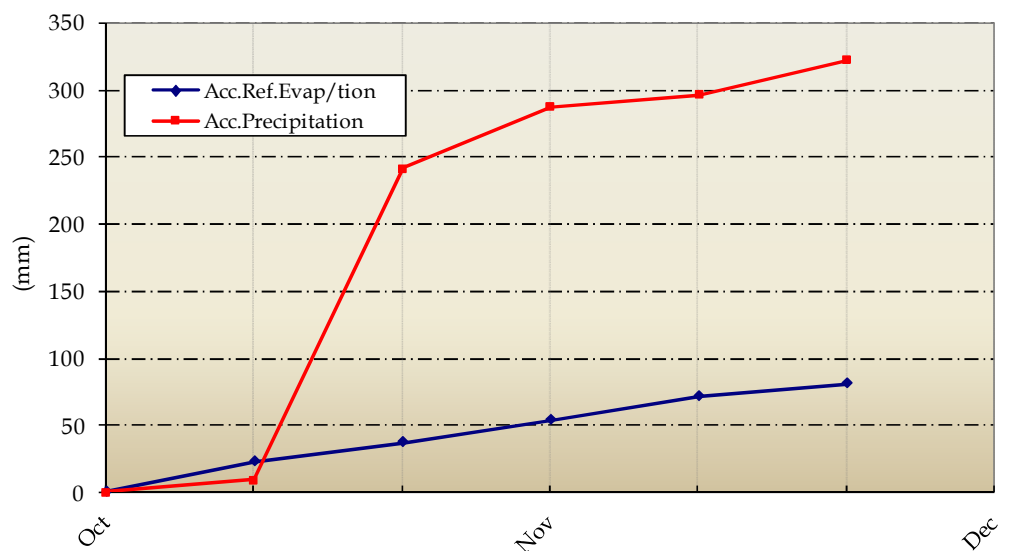
Web addresses of HNMS
www.hnms.gr
www.emy.gov.gr
www.meteo.gov.gr
www.meteohellas.gr

Agrinio

2nd 10-day period (11-20/11/2010)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	24.4	21.7	23.4	24.4	23.6	21.4	19.0	19.6	21.0	21.0	22.0	-	18.6
	Min	12.5	12.4	7.8	11.0	9.0	9.0	11.0	10.0	10.0	11.6	10.4	-	7.7
Relative Humidity	Max	95	98	97	97	95	97	100	95	97	93	96	-	-
	Min	44	56	54	48	50	65	77	62	59	71	59	-	-
Soil Temperature at 10 cm	06 UTC	17.2	16.6	15.0	15.6	15.2	14.4	15.4	15.2	15.2	15.0	15.5	-	12.0
	12 UTC	18.2	17.5	16.6	16.8	16.2	16.2	16.2	16.0	16.2	16.4	16.6	-	14.1
Sunshine Duration		6.5	7.8	6.0	8.2	6.0	6.0	2.4	5.1	5.8	4.2	5.8	-	4.4
Precipitation			4.5			1.9	1.9	16.4	0.9			25.6	-	53.7
Evaporation		1.6	1.7	2.2	0.1	1.9	0.5	0.9	2.2	0.2	1.0	12.3	-	17.2
Growing Degrees	5	13.5	12.1	10.6	12.7	11.3	10.2	10.0	9.8	10.5	11.3	111.9	-	81.2
	10	8.5	7.1	5.6	7.7	6.3	5.2	5.0	4.8	5.5	6.3	61.9	-	33.0

2nd 10-day period (11-20/11/2010)	Previous Year Value	Past Years Mean Value	
Reference Evapotranspiration	9.6	-	11.3
Precipitation - Reference Evapotranspiration	16.0	-	42.4
Number of Rainy Days	5.0	-	4.4
Number of Dry Days	2.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

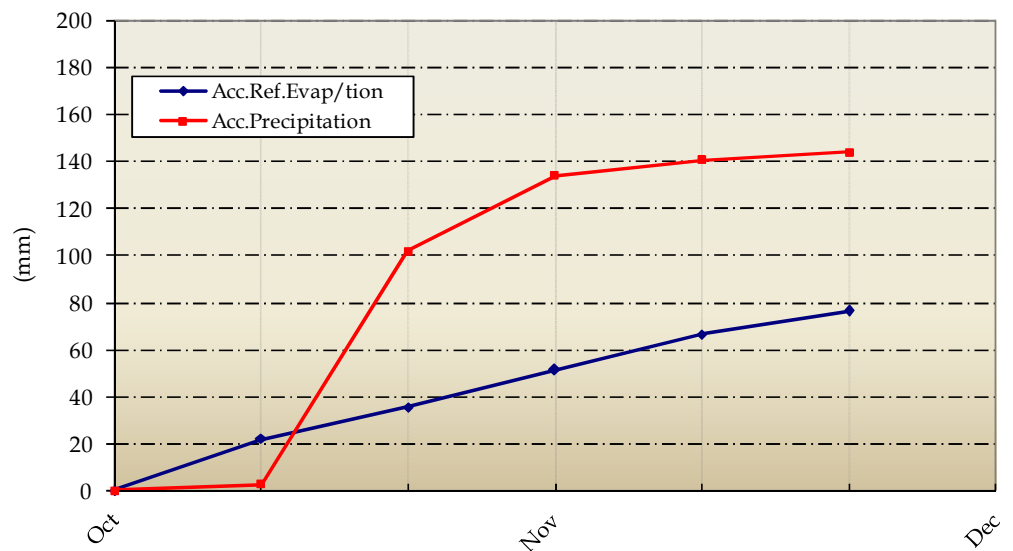


Alexandroupoli

2nd 10-day period (11-20/11/2010)		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	19.2	21.4	22.2	24.0	19.4	18.2	19.8	19.4	18.4	20.3	15.4	14.4
	Min	18.8	15.2	12.4	9.4	9.4	13.0	10.2	14.0	9.6	11.0	12.3	6.7	6.2
Relative Humidity	Max	96	96	95	95	93	95	95	93	95	95	95	97	-
	Min	76	80	65	53	46	71	75	56	72	74	67	70	-
Soil Temperature at 10 cm	06 UTC	16.6	15.8	14.6	13.4	13.2	14.4	14.0	14.8	13.8	13.6	14.4	11.7	9.7
	12 UTC	17.2	16.2	16.0	15.0	14.8	15.0	15.0	16.0	15.0	15.0	15.5	13.0	11.5
Sunshine Duration		2.5	0.7	7.9	5.1	4.4	5.7	3.2	7.6	8.3	7.7	5.3	3.9	3.9
Precipitation			0.5				0.6		2.2			3.3	13.4	29.1
Evaporation		2.7	0.7	0.9	1.5	1.8	1.9	2.3	4.0	3.1	1.5	20.4	14.5	18.6
Growing Degrees	5	15.1	12.2	11.9	10.8	11.7	11.2	9.2	11.9	9.5	9.7	113.2	60.9	54.2
	10	10.1	7.2	6.9	5.8	6.7	6.2	4.2	6.9	4.5	4.7	63.2	12.4	17.6

2nd 10-day period (11-20/11/2010)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	10.0	7.4	11.3
Precipitation - Reference Evapotranspiration	-6.7	6.0	17.8
Number of Rainy Days	3.0	3.0	2.9
Number of Dry Days	2.0	0.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

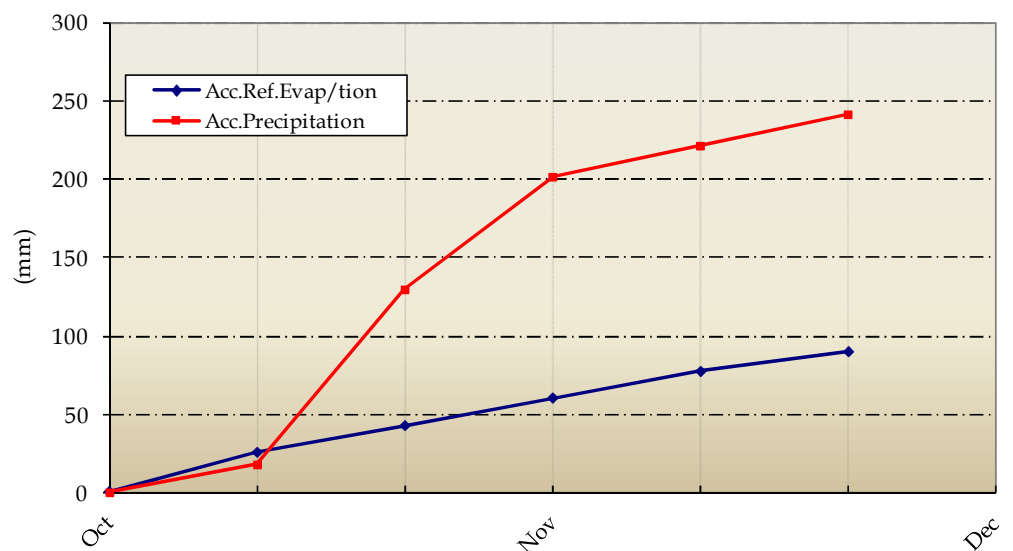


Andravida

2nd 10-day period (11-20/11/2010)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	24.8	21.0	22.6	24.2	22.8	22.4	20.0	21.0	21.2	21.0	22.1	18.6	18.6
	Min	16.2	14.6	12.6	10.6	9.2	12.8	13.6	12.2	11.6	12.2	12.6	8.6	9.7
Relative Humidity	Max	94	96	95	93	97	93	95	91	91	93	94	97	-
	Min	44	57	54	50	51	63	71	56	56	65	57	62	-
Soil Temperature at 10 cm	06 UTC	17.8	17.2	15.8	15.4	15.4	16.0	16.4	15.2	15.2	14.4	15.9	13.9	13.2
	12 UTC	19.8	20.0	18.0	19.0	19.0	19.2	17.8	17.2	18.2	18.4	18.7	16.9	15.2
Sunshine Duration		6.1	6.4	4.3	6.9	6.7	7.5	2.1	6.0	7.2	6.0	5.9	6.6	4.9
Precipitation								17.6	2.6			20.2	11.0	50.9
Evaporation		4.1	1.3	1.6	2.2	1.9	3.2	3.2	1.0	2.3	1.6	22.4	9.9	21.4
Growing Degrees	5	15.5	12.8	12.6	12.4	11.0	12.6	11.8	11.6	11.4	11.6	123.3	86.1	91.7
	10	10.5	7.8	7.6	7.4	6.0	7.6	6.8	6.6	6.4	6.6	73.3	36.1	42.4

2nd 10-day period (11-20/11/2010)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	12.7	10.6	11.8
Precipitation - Reference Evapotranspiration	7.5	0.4	39.1
Number of Rainy Days	2.0	2.0	4.2
Number of Dry Days	8.0	0.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

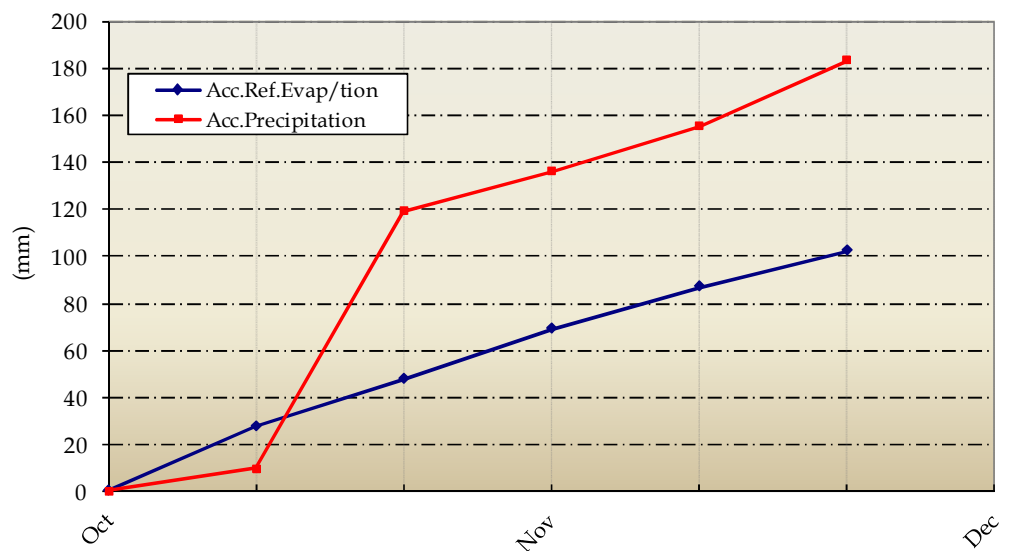


Kalamata

2nd 10-day period (11-20/11/2010)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	23.4	23.0	22.6	24.0	24.0	22.4	18.2	20.8	21.8	22.8	22.3	20.1	19.5
	Min	12.4	15.0	12.4	17.0	14.4	11.0	11.8	9.0	8.8	9.0	12.1	8.5	9.3
Relative Humidity	Max	98	98	91	77	95	97	98	97	97	95	94	96	-
	Min	72	62	56	47	52	61	80	53	57	56	60	57	-
Soil Temperature at 10 cm	06 UTC	18.0	18.0	18.0	18.0	18.0	17.6	17.0	16.2	16.0	16.0	17.3	14.5	14.0
	12 UTC	19.0	19.4	18.4	18.6	18.4	18.0	17.4	16.6	16.6	16.6	17.9	15.3	15.4
Sunshine Duration		7.5	7.3	4.1	4.6	7.0	6.4	0.7	8.0	7.4	7.1	6.0	7.8	4.6
Precipitation			0.0			3.1		24.8				27.9	32.6	55.3
Evaporation		1.6	3.0	1.2	2.4	2.3	0.6	1.9	7.2	1.9	1.3	23.4	17.2	22.8
Growing Degrees	5	12.9	14.0	12.5	15.5	14.2	11.7	10.0	9.9	10.3	10.9	121.9	92.9	93.9
	10	7.9	9.0	7.5	10.5	9.2	6.7	5.0	4.9	5.3	5.9	71.9	42.9	44.2

2nd 10-day period (11-20/11/2010)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	15.3	15.1	13.4
Precipitation - Reference Evapotranspiration	12.6	17.5	41.9
Number of Rainy Days	2.0	2.0	3.8
Number of Dry Days	5.0	0.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

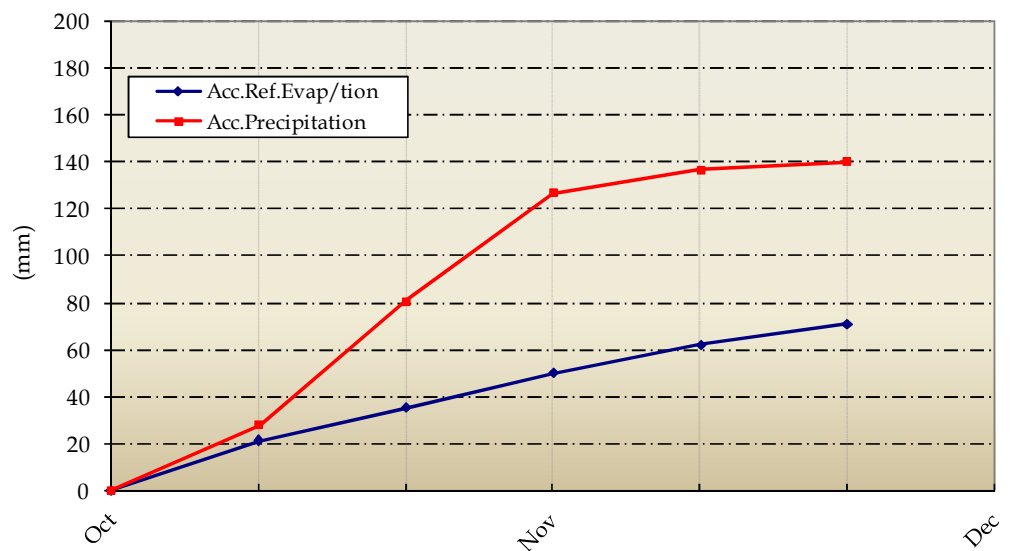


Larisa

2nd 10-day period (11-20/11/2010)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	20.2	22.6	19.4	22.0	20.4	20.2	16.0	17.4	19.2	18.0	19.5	17.8	15.3
	Min	10.6	10.0	6.0	7.8	8.0	8.4	9.6	7.2	7.4	7.2	8.2	5.0	5.5
Relative Humidity	Max	93	95	97	97	97	97	100	100	97	97	97	98	-
	Min	61	46	69	58	63	67	93	64	56	61	64	58	-
Soil Temperature at 10 cm	06 UTC	14.6	14.2	13.8	13.8	14.8	13.8	14.2	14.0	12.4	12.0	13.8	12.0	10.9
	12 UTC	15.2	15.4	15.0	15.6	15.8	14.8	14.6	14.8	14.4	15.0	15.1	13.3	11.6
Sunshine Duration		0.3	7.2	3.2	7.2	5.2	5.9	0.0	4.8	5.3	5.0	4.4	5.8	3.5
Precipitation								3.5				3.5	0.1	21.2
Evaporation		1.3	2.3	0.9	0.6	0.8	1.7	0.5	1.7	0.8	0.1	10.7	11.0	13.7
Growing Degrees	5	10.4	11.3	7.7	9.9	9.2	9.3	7.8	7.3	8.3	7.6	88.8	63.9	54.7
	10	5.4	6.3	2.7	4.9	4.2	4.3	2.8	2.3	3.3	2.6	38.8	14.9	14.5

2nd 10-day period (11-20/11/2010)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	8.9	8.2	8.8
Precipitation - Reference Evapotranspiration	-5.4	-8.1	12.4
Number of Rainy Days	1.0	1.0	3.4
Number of Dry Days	7.0	0.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

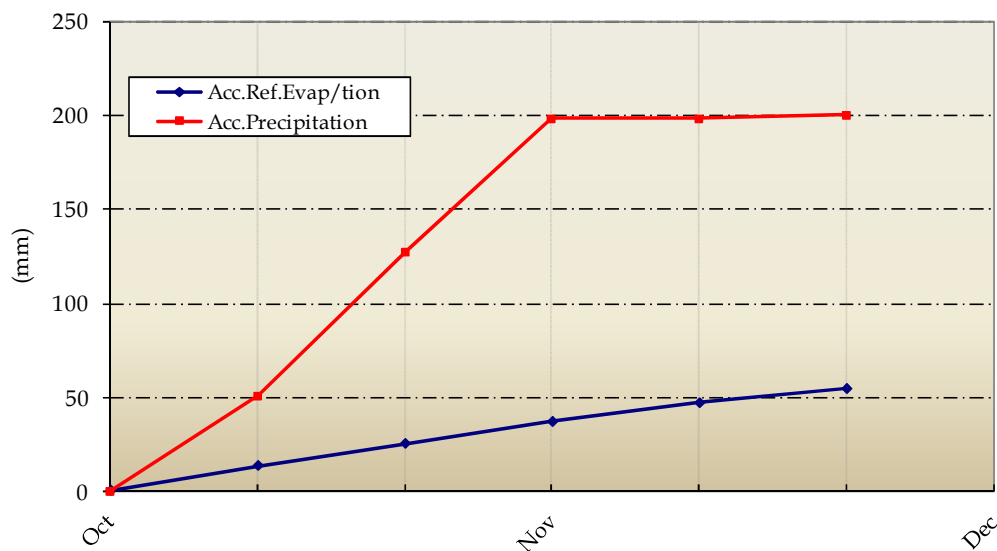


Series

2nd 10-day period (11-20/11/2010)		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	22.2	22.6	23.6	21.0	21.6	18.0	20.4	20.0	17.6	20.8	17.3	13.7
	Min	12.0	10.4	10.8	7.6	7.6	10.0	10.2	9.0	6.6	7.6	9.2	4.1	4.7
Relative Humidity	Max	95	95	95	97	97	95	95	95	95	95	95	91	-
	Min	58	56	54	49	54	51	76	39	56	71	56	53	-
Soil Temperature at 10 cm	06 UTC	14.0	13.4	13.2	12.4	11.8	12.6	13.2	12.8	11.2	11.8	12.6	10.4	8.8
	12 UTC	14.4	13.6	13.8	13.4	12.8	12.2	14.6	13.4	12.8	12.2	13.3	11.9	10.0
Sunshine Duration		0.0	3.3	4.5	5.0	3.7	4.5	0.2	3.0	3.2	1.8	2.9	3.7	3.4
Precipitation								2.0				2.0		18.2
Evaporation		0.7	1.0	2.5	0.7	1.7	0.7	0.0	1.3	0.5	0.9	10.0	17.0	10.3
Growing Degrees	5	11.7	11.3	11.7	10.6	9.3	10.8	9.1	9.7	8.3	7.6	100.1	57.0	43.2
	10	6.7	6.3	6.7	5.6	4.3	5.8	4.1	4.7	3.3	2.6	50.1	10.7	10.2

2nd 10-day period (11-20/11/2010)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	7.6	7.7	6.6
Precipitation - Reference Evapotranspiration	-5.6	-7.7	11.6
Number of Rainy Days	1.0	0.0	2.9
Number of Dry Days	19.0	10.0	-

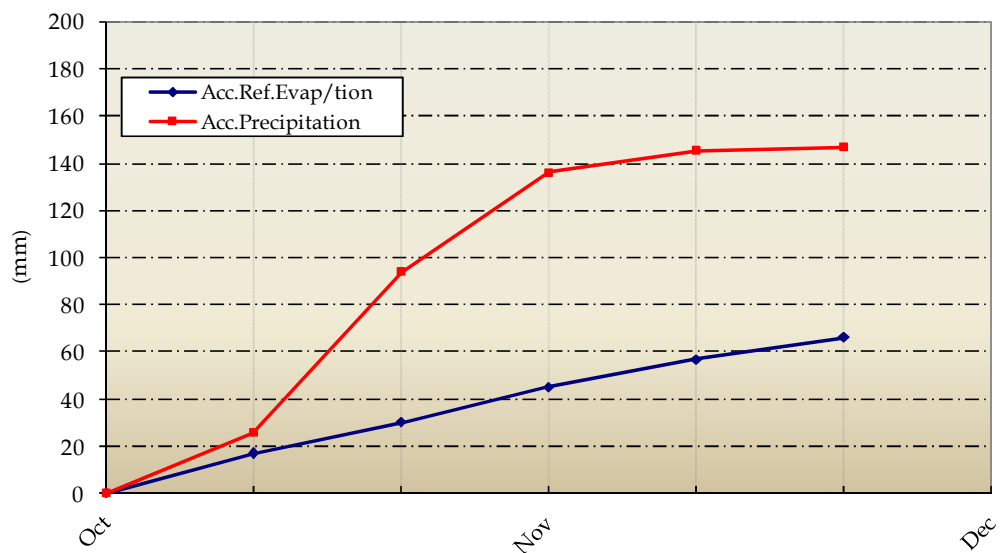
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



2nd 10-day period (11-20/11/2010)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	22.4	22.0	22.6	23.4	23.2	22.6	16.4	21.0	21.2	19.2	21.4	20.2	13.9
	Min	12.4	12.4	9.0	9.0	9.8	10.0	12.2	8.6	9.0	9.0	10.1	6.2	5.4
Relative Humidity	Max	95	95	95	93	95	96	93	95	99	100	96	96	-
	Min	45	40	40	37	38	45	91	28	44	67	48	43	-
Soil Temperature at 10 cm	06 UTC	15.2	14.8	14.0	13.8	13.6	14.2	14.4	13.8	13.4	13.6	14.1	11.0	10.6
	12 UTC	15.4	14.8	15.0	14.8	14.4	15.2	15.0	14.4	14.2	14.2	14.7	13.6	10.9
Sunshine Duration		1.4	6.9	5.2	8.2	5.6	6.1	0.0	7.4	3.7	6.2	5.1	6.2	3.4
Precipitation								1.3				1.3		27.5
Evaporation		1.0	0.4	1.0	0.3	1.3	0.4	0.5	0.8	0.5	0.2	6.4	11.8	9.6
Growing Degrees	5	12.4	12.2	10.8	11.2	11.5	11.3	9.3	9.8	10.1	9.1	107.7	82.4	47.4
	10	7.4	7.2	5.8	6.2	6.5	6.3	4.3	4.8	5.1	4.1	57.7	32.4	11.9

2nd 10-day period (11-20/11/2010)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	9.2	9.3	8.1
Precipitation - Reference Evapotranspiration	-7.9	-9.3	19.4
Number of Rainy Days	1.0	0.0	3.5
Number of Dry Days	6.0	10.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

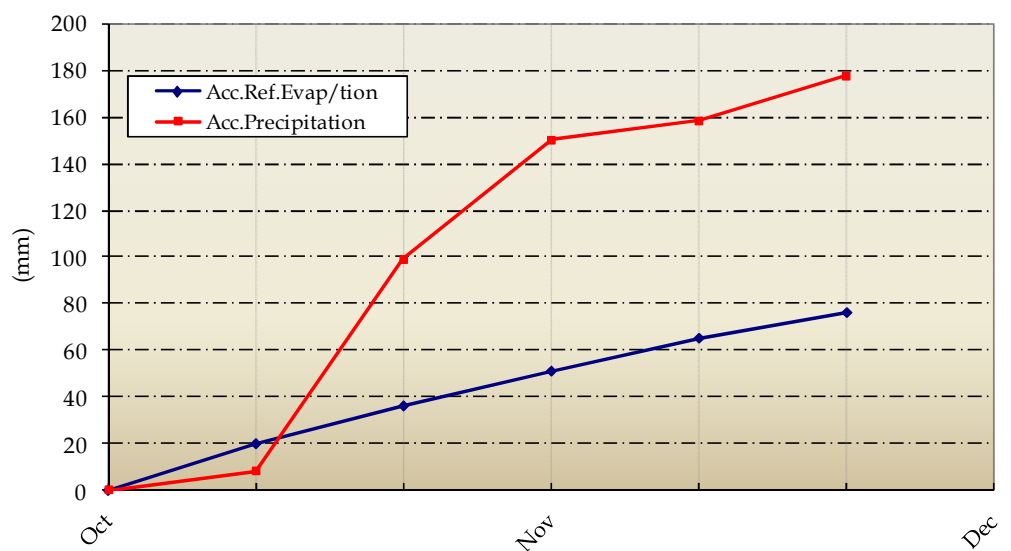


Tripoli

2nd 10-day period (11-20/11/2010)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	21.8	20.4	16.6	20.4	16.8	18.4	14.2	15.8	18.6	19.2	18.2	-	14.9
	Min	10.0	8.6	9.2	12.6	8.2	6.0	8.0	8.2	4.2	4.0	7.9	-	4.4
Relative Humidity	Max	95	94	93	76	97	100	100	97	100	97	95	-	-
	Min	54	44	68	53	63	59	84	61	56	48	59	-	-
Soil Temperature at 10 cm	06 UTC	12.4	12.4	13.2	13.0	11.8	11.2	12.4	11.0	10.0	9.4	11.7	-	9.7
	12 UTC	15.4	15.8	14.6	15.4	14.6	14.4	13.6	13.4	13.4	12.8	14.3	-	10.8
Sunshine Duration		5.9	5.8	3.6	7.0	4.4	4.4	1.0	6.1	6.4	6.6	5.1	-	4.5
Precipitation			0.0	9.7	1.1			8.5				19.3	-	45.7
Evaporation		1.0	1.0	0.8	2.0	1.0	0.0	0.5	1.0	0.0	1.0	8.3	-	15.6
Growing Degrees	5	10.9	9.5	7.9	11.5	7.5	7.2	6.1	7.0	6.4	6.6	80.6	-	46.8
	10	5.9	4.5	2.9	6.5	2.5	2.2	1.1	2.0	1.4	1.6	30.6	-	10.1

2nd 10-day period (11-20/11/2010)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	11.0	-	10.5
Precipitation - Reference Evapotranspiration	8.3	-	35.2
Number of Rainy Days	3.0	-	4.0
Number of Dry Days	3.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

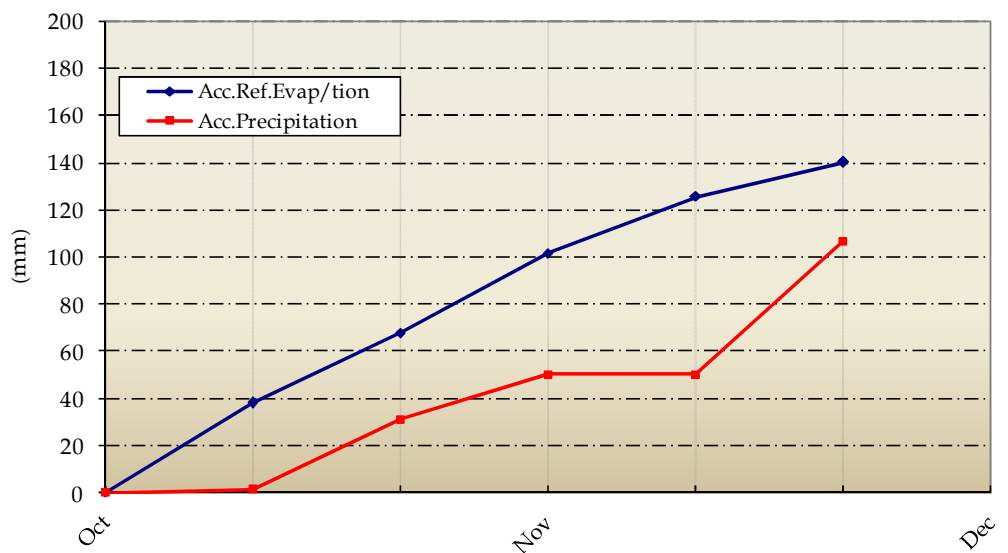


Tympaki

2nd 10-day period (11-20/11/2010)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	29.4	23.4	21.0	21.8	21.0	21.8	21.8	23.0	22.2	21.8	22.7	22.3	20.8
	Min	12.6	17.0	14.4	15.4	15.2	13.4	13.6	13.8	12.4	12.4	14.0	11.8	11.4
Relative Humidity	Max	78	100	100	98	98	96	97	97	98	98	96	94	-
	Min	31	68	74	78	60	60	62	64	63	69	63	42	-
Soil Temperature at 10 cm	06 UTC	18.8	21.4	17.6	17.6	17.4	16.4	16.8	15.8	16.2	16.2	17.4	15.6	16.3
	12 UTC	24.0	20.6	18.8	19.6	19.6	20.2	20.8	20.6	20.4	19.4	20.4	19.4	19.2
Sunshine Duration		8.2	0.0	1.3	1.6	1.9	9.4	4.9	8.5	8.9	7.0	5.2	5.7	5.7
Precipitation			26.1	3.1	19.4	8.2						56.8	26.7	19.0
Evaporation		3.4	2.5	1.2	3.9	1.8	2.1	1.9	2.5	2.3	1.9	23.5	36.7	31.4
Growing Degrees	5	16.0	15.2	12.7	13.6	13.1	12.6	12.7	13.4	12.3	12.1	133.7	120.6	110.9
	10	11.0	10.2	7.7	8.6	8.1	7.6	7.7	8.4	7.3	7.1	83.7	70.6	61.0

2nd 10-day period (11-20/11/2010)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	14.6	23.3	18.0
Precipitation - Reference Evapotranspiration	42.2	3.4	1.0
Number of Rainy Days	4.0	2.0	2.5
Number of Dry Days	13.0	2.0	-

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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ΥΠΗΡΕΣΙΑ

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