

# AGROMETEOROLOGICAL BULLETIN

*April 2011*  
*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



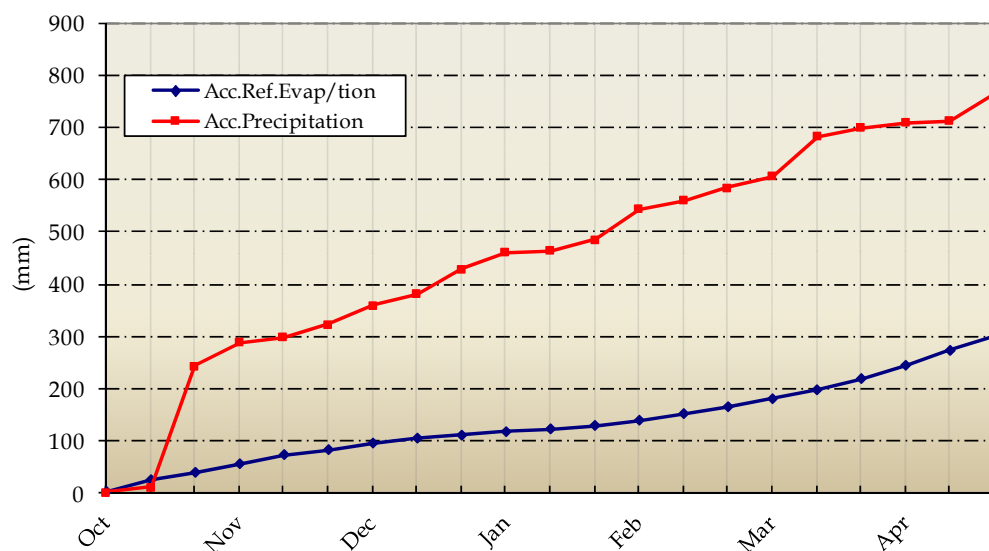
Hellenic National Meteorological Service  
Division of Climatology-Applications  
El. Venizelou Street 14, 16777  
Helliniko, Athens

*Web addresses of HNMS*  
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2nd 10-day period (11-20/04/2011)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	23.6	19.8	20.4	17.4	19.6	12.4	12.4	16.4	17.8	21.6	18.1	-	19.5
	Min	6.2	7.2	8.0	9.0	3.8	10.6	7.0	8.0	6.4	6.4	7.3	-	7.7
Relative Humidity	Max	97	87	100	97	93	97	94	89	91	94	94	-	-
	Min	29	57	55	30	35	88	79	47	37	34	49	-	-
Soil Temperature at 10 cm	06 UTC	14.2	14.4	14.6	15.4	13.2	15.0	15.4	12.6	12.8	13.4	14.1	-	13.0
	12 UTC	17.4	16.6	18.2	17.8	16.6	15.0	13.8	15.4	15.4	17.2	16.3	-	17.5
Sunshine Duration		10.7	3.7	9.4	12.0	8.3	0.0	0.0	7.3	7.1	9.9	6.8	-	6.3
Precipitation							18.0	22.1	12.6			52.7	-	28.9
Evaporation		5.7	1.8	7.3	5.2	8.1	1.2	1.5	2.4	6.2	4.6	44.0	-	38.3
Growing Degrees	5	9.9	8.5	9.2	8.2	6.7	6.5	4.7	7.2	7.1	9.0	77.0	-	86.2
	10	4.9	3.5	4.2	3.2	1.7	1.5	0.0	2.2	2.1	4.0	27.3	-	36.9

2nd 10-day period (11-20/04/2011)	Previous Year Value	Past Years Mean Value	
Reference Evapotranspiration	27.4	-	28.5
Precipitation - Reference Evapotranspiration	25.3	-	0.4
Number of Rainy Days	3.0	-	3.9
Number of Dry Days	9.0	-	-

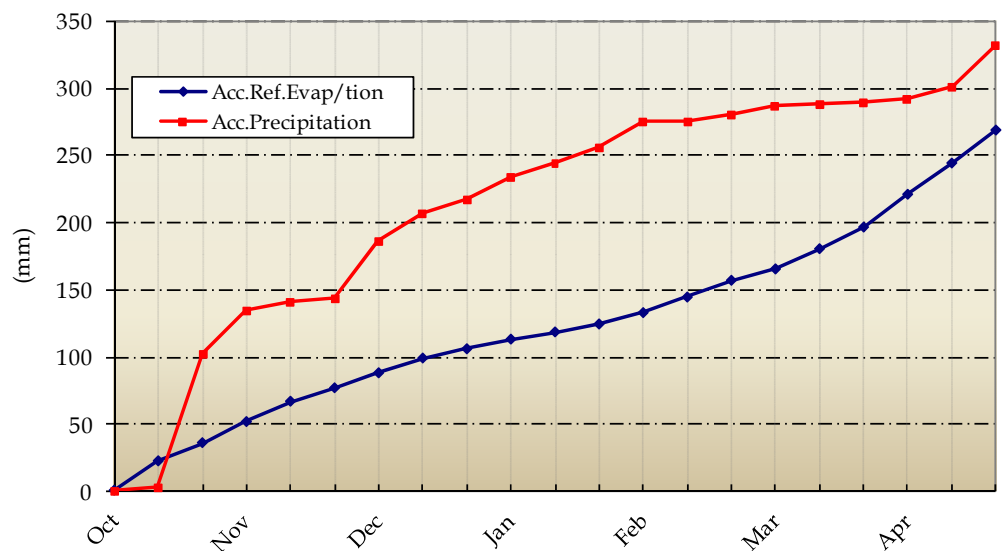
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



2nd 10-day period (11-20/04/2011)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	13.8	15.0	18.0	15.4	15.2	16.4	13.8	10.8	11.8	18.4	14.9	18.7	16.6
	Min	7.0	1.4	6.6	7.6	3.2	5.2	8.2	5.0	6.0	8.8	5.9	9.0	7.0
Relative Humidity	Max	89	85	91	98	94	94	91	94	94	95	92	89	-
	Min	39	55	69	74	44	40	42	63	61	44	53	47	-
Soil Temperature at 10 cm	06 UTC	12.6	10.0	11.6	13.6	9.6	10.4	11.0	10.0	8.4	9.6	10.7	13.6	11.5
	12 UTC	13.4	14.0	15.0	12.6	13.6	13.2	12.2	9.4	10.0	11.0	12.4	16.1	14.7
Sunshine Duration		5.5	8.4	8.8	4.4	11.9	8.5	0.3	0.0	0.0	4.7	5.2	8.0	5.9
Precipitation		0.8			20.7				6.5	2.0	1.3	31.3	12.1	15.2
Evaporation		2.0	8.9	5.2	6.6	5.0	7.0	5.4	2.1	1.5	4.5	48.2	43.8	38.8
Growing Degrees	5	5.4	3.2	7.3	6.5	4.2	5.8	6.0	2.9	3.9	8.6	53.8	88.7	67.9
	10	0.4	0.0	2.3	1.5	0.0	0.8	1.0	0.0	0.0	3.6	9.6	38.7	22.8

2nd 10-day period (11-20/04/2011)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	24.6	30.2	26.7
Precipitation - Reference Evapotranspiration	6.7	-18.1	-11.5
Number of Rainy Days	5.0	3.0	2.8
Number of Dry Days	7.0	5.0	-

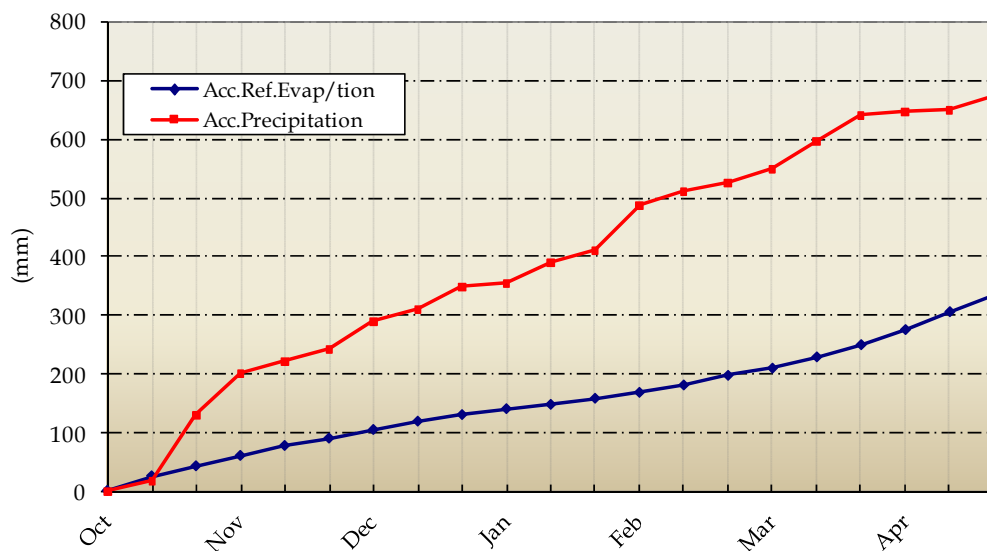
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



2nd 10-day period (11-20/04/2011)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	20.8	17.6	19.2	16.0	17.2	14.0	12.2	16.4	17.6	19.4	17.0	21.9	18.4
	Min	8.0	10.0	9.4	10.8	6.6	9.8	9.8	9.0	6.6	7.8	8.8	10.5	9.1
Relative Humidity	Max	91	88	90	82	85	91	97	95	91	86	90	93	-
	Min	49	63	63	42	43	78	81	55	46	44	56	44	-
Soil Temperature at 10 cm	06 UTC	15.4	16.0	14.7	15.2	13.2	12.8	12.6	13.0	13.2	14.2	14.0	15.9	13.7
	12 UTC	22.2	18.4	19.0	20.0	19.6	16.0	12.8	14.0	19.8	21.2	18.3	21.2	16.7
Sunshine Duration		11.0	3.8	9.8	12.0	10.3	0.0	0.0	3.3	12.1	11.5	7.4	8.0	7.2
Precipitation				0.7	0.5		6.1	17.2	0.2			24.7	1.7	25.7
Evaporation		4.5	3.5	5.1	5.2	3.1	1.7	0.2	2.9	5.5	4.4	36.1	48.2	37.7
Growing Degrees	5	9.4	8.8	9.3	8.4	6.9	6.9	6.0	7.7	7.1	8.6	79.1	112.1	87.1
	10	4.4	3.8	4.3	3.4	1.9	1.9	1.0	2.7	2.1	3.6	29.1	62.1	37.4

2nd 10-day period (11-20/04/2011)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	28.5	33.0	28.0
Precipitation - Reference Evapotranspiration	-3.8	-31.3	-2.3
Number of Rainy Days	5.0	2.0	3.3
Number of Dry Days	6.0	19.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

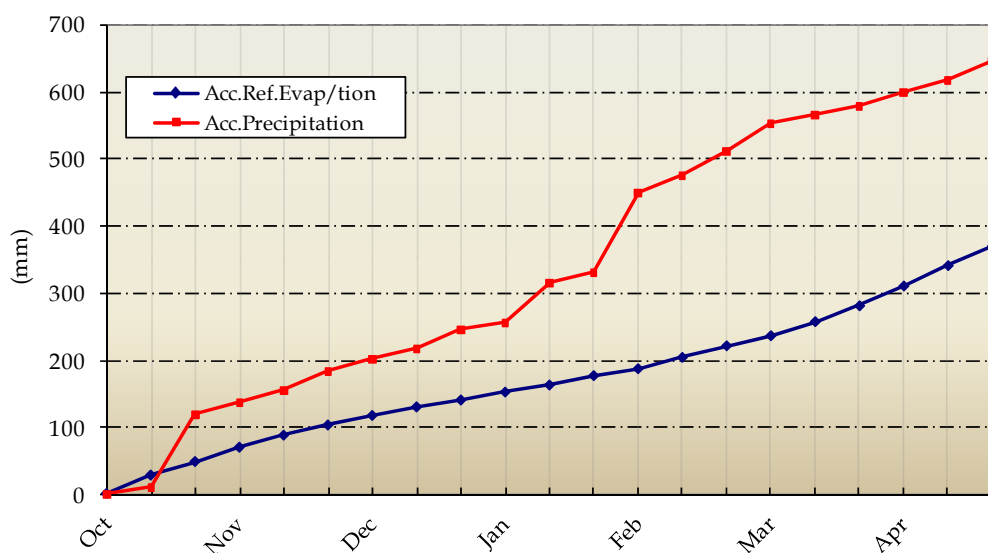


Kalamata

2nd 10-day period (11-20/04/2011)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	20.4	17.6	21.4	18.2	18.2	20.6	15.8	14.4	16.4	17.8	18.1	22.0	19.2
	Min	10.0	11.2	7.0	12.4	4.8	9.6	10.4	9.4	7.4	6.0	8.8	9.5	8.4
Relative Humidity	Max	100	95	97	91	87	95	97	97	97	97	95	94	-
	Min	55	56	49	29	43	44	63	74	49	49	51	44	-
Soil Temperature at 10 cm	06 UTC	15.8	16.0	14.4	16.0	14.0	15.2	15.0	14.0	13.4	13.6	14.7	15.6	13.9
	12 UTC	18.4	17.4	17.4	18.0	17.2	17.0	15.6	15.6	16.0	15.8	16.8	17.5	16.9
Sunshine Duration		9.7	2.7	10.8	11.6	11.6	2.4	1.9	0.1	6.1	8.4	6.5	8.9	7.1
Precipitation					1.6		0.9	5.4	19.1	0.4		27.4	9.5	25.5
Evaporation		6.0	4.0	5.0	5.8	4.5	3.4	2.1	7.2	2.2	3.2	43.4	55.1	41.0
Growing Degrees	5	10.2	9.4	9.2	10.3	6.5	10.1	8.1	6.9	6.9	6.9	84.5	107.8	88.0
	10	5.2	4.4	4.2	5.3	1.5	5.1	3.1	1.9	1.9	1.9	34.5	57.8	38.2

2nd 10-day period (11-20/04/2011)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	29.1	35.8	28.5
Precipitation - Reference Evapotranspiration	-1.7	-26.3	-3.0
Number of Rainy Days	5.0	2.0	4.1
Number of Dry Days	10.0	19.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

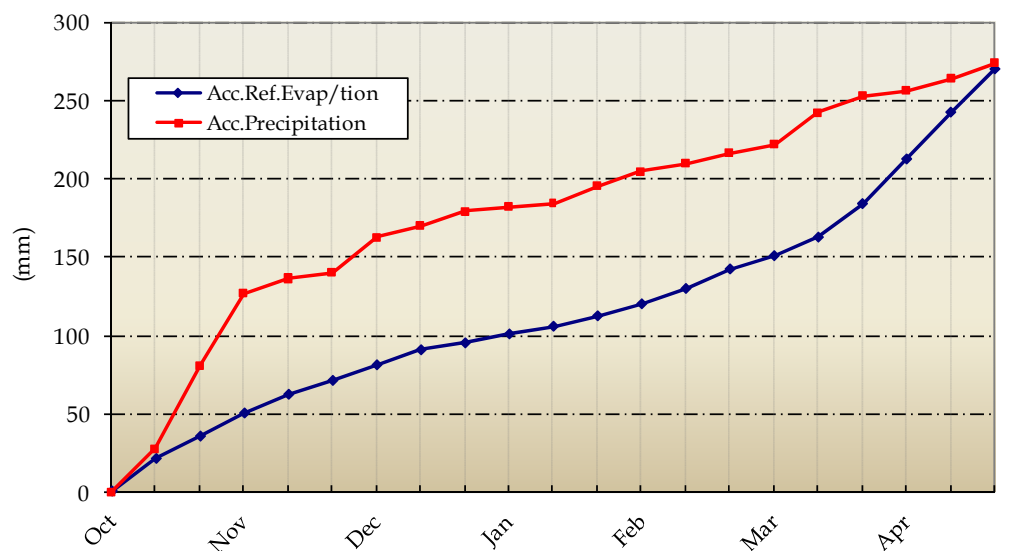


Larisa

2nd 10-day period (11-20/04/2011)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	18.8	22.2	23.6	18.0	17.2	13.2	12.8	10.0	17.0	19.2	17.2	19.7	19.0
	Min	8.8	3.6	6.8	7.8	5.0	9.4	8.0	7.0	7.0	5.6	6.9	9.5	6.4
Relative Humidity	Max	79	87	85	95	84	89	92	94	95	100	90	95	-
	Min	24	36	30	29	43	69	59	62	43	40	44	53	-
Soil Temperature at 10 cm	06 UTC	11.0	11.0	12.0	12.0	11.6	13.8	12.6	11.4	11.4	11.8	11.9	14.9	12.8
	12 UTC	15.0	13.6	14.2	12.4	13.2	12.8	12.6	11.0	13.0	14.8	13.3	16.2	14.4
Sunshine Duration		10.9	10.9	6.4	12.1	4.7	0.0	0.0	0.0	6.1	6.9	5.8	4.3	6.4
Precipitation					2.0		3.2	2.0	3.2	0.0		10.4	7.5	13.6
Evaporation		8.0	3.0	5.0	5.0	3.3	6.7	0.0	0.1	3.6	1.8	36.5	-	36.9
Growing Degrees	5	8.8	7.9	10.2	7.9	6.1	6.3	5.4	3.5	7.0	7.4	70.5	95.9	77.0
	10	3.8	2.9	5.2	2.9	1.1	1.3	0.4	0.0	2.0	2.4	22.0	45.9	28.8

2nd 10-day period (11-20/04/2011)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	27.7	27.2	28.6
Precipitation - Reference Evapotranspiration	-17.3	-19.7	-15.0
Number of Rainy Days	4.0	4.0	3.4
Number of Dry Days	11.0	11.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



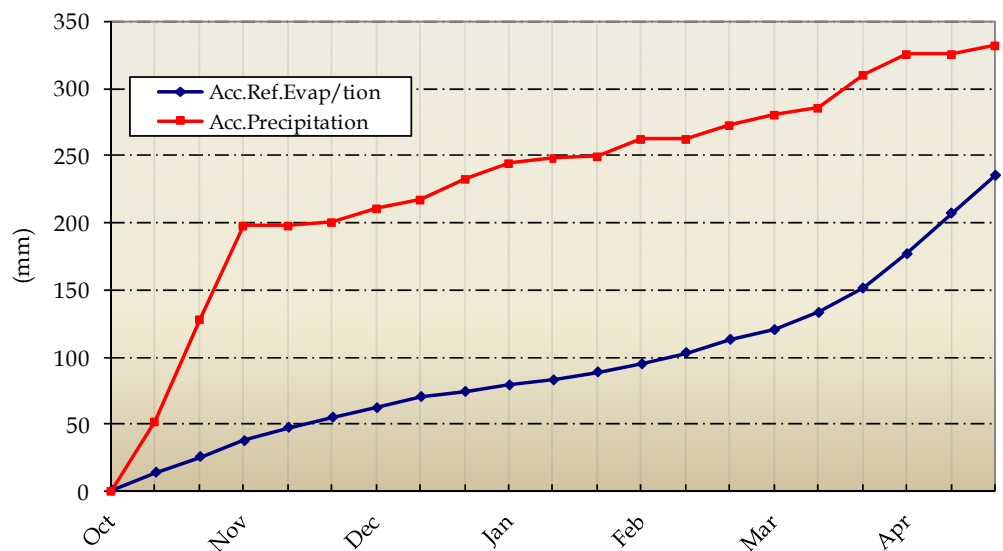


Series

2nd 10-day period (11-20/04/2011)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	19.0	23.2	21.2	16.4	18.6	17.4	18.6	13.6	15.8	24.2	18.8	19.6	19.0
	Min	8.4	2.2	5.4	6.2	3.0	2.8	6.4	6.8	7.6	4.4	5.3	10.3	7.6
Relative Humidity	Max	76	88	87	84	84	90	95	90	89	93	88	88	-
	Min	12	23	41	28	24	36	33	37	43	25	30	51	-
Soil Temperature at 10 cm	06 UTC	14.6	13.4	14.0	14.6	13.0	13.0	13.6	14.4	13.0	12.2	13.6	14.9	12.3
	12 UTC	16.4	15.6	16.0	16.0	15.4	14.8	16.2	14.2	13.8	14.6	15.3	15.9	15.2
Sunshine Duration		11.0	7.2	6.8	8.7	9.9	2.3	5.7	0.0	0.0	8.7	6.0	3.4	5.9
Precipitation					3.6			0.5	2.0	0.0		6.1	18.3	15.0
Evaporation		5.4	3.5	4.3	4.2	4.7	0.5	0.4	1.3	1.3	4.5	30.1	20.2	31.1
Growing Degrees	5	8.7	7.7	8.3	6.3	5.8	5.1	7.5	5.2	6.7	9.3	70.6	99.7	82.9
	10	3.7	2.7	3.3	1.3	0.8	0.1	2.5	0.2	1.7	4.3	20.6	49.7	34.2

2nd 10-day period (11-20/04/2011)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	28.3	23.3	25.7
Precipitation - Reference Evapotranspiration	-22.2	-5.0	-10.7
Number of Rainy Days	3.0	5.0	3.4
Number of Dry Days	7.0	8.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

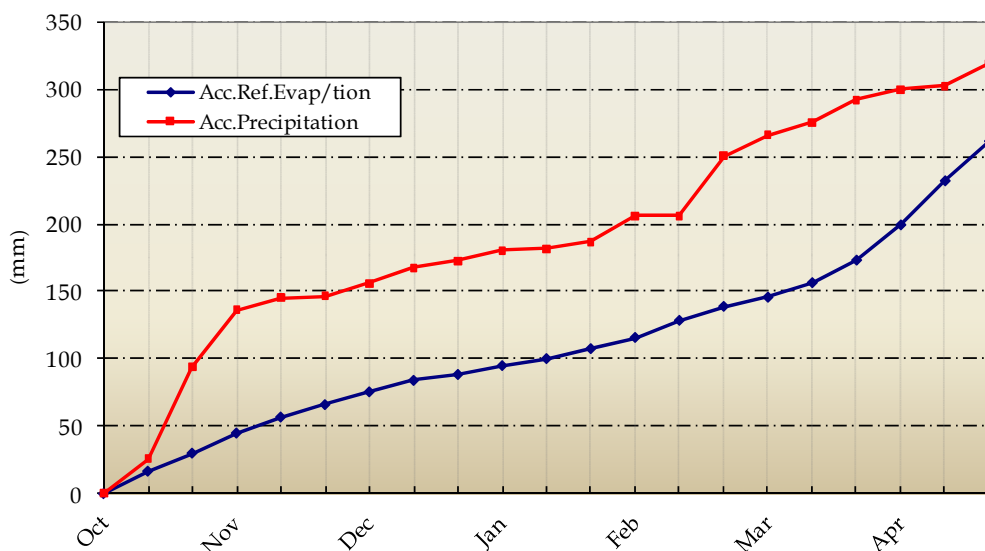


Trikala Imathias

2nd 10-day period (11-20/04/2011)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	19.0	20.4	21.4	18.6	19.6	16.0	17.0	13.8	19.0	23.0	18.8	19.3	19.3
	Min	8.4	2.2	5.2	5.2	3.0	7.2	8.6	6.0	7.8	7.8	6.1	11.5	8.0
Relative Humidity	Max	25	91	89	87	88	100	100	100	100	95	88	98	-
	Min	11	28	45	26	24	44	39	75	30	25	35	60	-
Soil Temperature at 10 cm	06 UTC	13.2	12.8	13.4	13.4	12.4	12.4	13.2	13.4	13.6	12.4	13.0	14.8	13.1
	12 UTC	15.8	16.0	15.8	15.6	15.6	14.6	15.0	13.0	15.0	15.2	15.2	16.3	14.0
Sunshine Duration		10.8	11.3	7.2	10.1	9.7	0.4	0.8	0.2	3.9	9.1	6.4	3.1	5.8
Precipitation					7.4		1.3		7.7			16.4	22.9	13.7
Evaporation		5.4	3.6	2.7	4.2	1.9	1.8	1.9	0.9	2.3	1.7	26.4	20.8	31.0
Growing Degrees	5	8.7	6.3	8.3	6.9	6.3	6.6	7.8	4.9	8.4	10.4	74.6	-	85.7
	10	3.7	1.3	3.3	1.9	1.3	1.6	2.8	0.0	3.4	5.4	24.7	-	37.9

2nd 10-day period (11-20/04/2011)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	29.5	22.6	27.0
Precipitation - Reference Evapotranspiration	-13.1	0.3	-13.3
Number of Rainy Days	3.0	7.0	3.0
Number of Dry Days	7.0	17.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



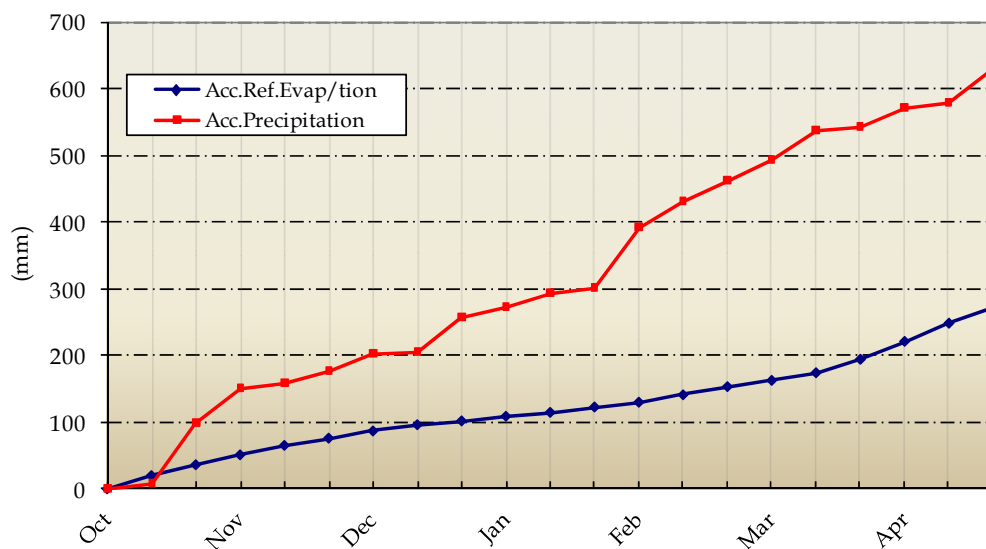


Tripoli

2nd 10-day period (11-20/04/2011)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	18.4	15.0	18.6	17.6	16.6	11.2	7.4	8.4	12.0	14.2	13.9	-	16.3
	Min	3.4	2.8	3.4	8.2	1.2	7.4	3.8	4.4	4.0	2.6	4.1	-	4.8
Relative Humidity	Max	93	93	93	76	84	97	94	97	94	97	92	-	-
	Min	35	52	47	28	49	82	85	76	47	47	55	-	-
Soil Temperature at 10 cm	06 UTC	12.2	11.4	10.4	12.8	11.2	13.6	9.4	8.0	8.2	8.4	10.6	-	10.9
	12 UTC	19.6	15.6	18.4	17.0	17.6	13.8	9.2	10.6	13.2	13.2	14.8	-	12.7
Sunshine Duration		7.4	4.8	9.9	10.8	10.2	0.0	0.0	0.0	5.9	6.0	5.5	-	6.7
Precipitation					1.0		16.0	28.8	5.7	0.7		52.2	-	30.8
Evaporation		3.0	3.0	4.0	2.0	4.0	1.9	0.1	1.6	2.0	2.0	23.6	-	29.8
Growing Degrees	5	5.9	3.9	6.0	7.9	3.9	4.3	0.6	1.4	3.0	3.4	40.3	-	55.6
	10	0.9	0.0	1.0	2.9	0.0	0.0	0.0	0.0	0.0	0.0	4.8	-	14.5

2nd 10-day period (11-20/04/2011)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	23.4	-	28.5
Precipitation - Reference Evapotranspiration	28.8	-	2.3
Number of Rainy Days	5.0	-	4.5
Number of Dry Days	8.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

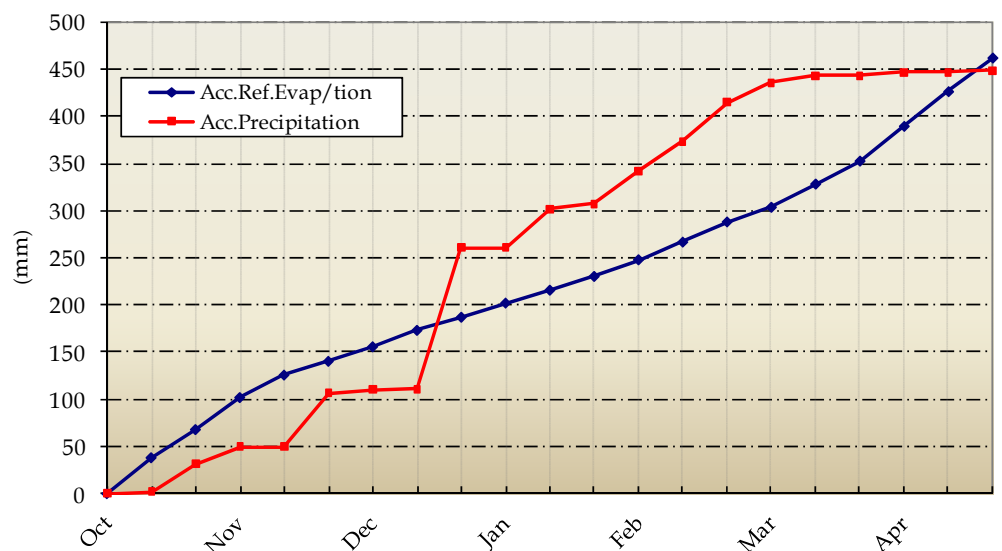


Tympaki

2nd 10-day period (11-20/04/2011)		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	19.8	19.2	19.4	18.6	20.0	25.8	21.0	18.0	19.0	20.3	23.3	20.2
	Min	10.2	6.2	8.0	10.4	7.4	9.4	13.6	14.8	12.8	7.0	10.0	11.5	10.4
Relative Humidity	Max	81	95	98	100	98	100	99	98	90	99	96	93	-
	Min	30	24	62	65	55	43	28	38	38	37	42	35	-
Soil Temperature at 10 cm	06 UTC	19.0	17.8	17.6	18.2	16.8	18.0	19.8	18.8	18.2	16.0	18.0	19.8	17.9
	12 UTC	24.6	23.2	23.0	20.0	22.8	23.6	23.0	23.2	21.0	20.4	22.5	25.2	22.0
Sunshine Duration		11.3	11.4	7.5	8.3	10.8	10.5	2.5	10.0	3.9	7.4	8.4	7.7	7.9
Precipitation					0.2			1.5		0.5		2.2	5.6	8.6
Evaporation		6.7	7.5	3.7	4.1	3.6	5.6	3.3	4.5	4.9	6.3	50.2	65.5	48.6
Growing Degrees	5	11.1	8.0	8.6	9.9	8.0	9.7	14.7	12.9	10.4	8.0	101.3	124.1	102.2
	10	6.1	3.0	3.6	4.9	3.0	4.7	9.7	7.9	5.4	3.0	51.3	74.1	52.5

2nd 10-day period (11-20/04/2011)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	35.6	38.4	32.4
Precipitation - Reference Evapotranspiration	-33.4	-32.8	-23.8
Number of Rainy Days	3.0	1.0	1.8
Number of Dry Days	13.0	24.0	-

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<sub>n</sub> 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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HELLENIC NATIONAL METEOROLOGICAL SERVICE

Division of Climatology-Applications

Issue Editors :

Charalabopoulos Christos

Filiou Anna

The present bulletin was designed and implemented under the support of Water Resources Management Division of Agriculture University of Athens (Professor A. Liakatas)