

# AGROMETEOROLOGICAL BULLETIN

*March 2012*  
*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  
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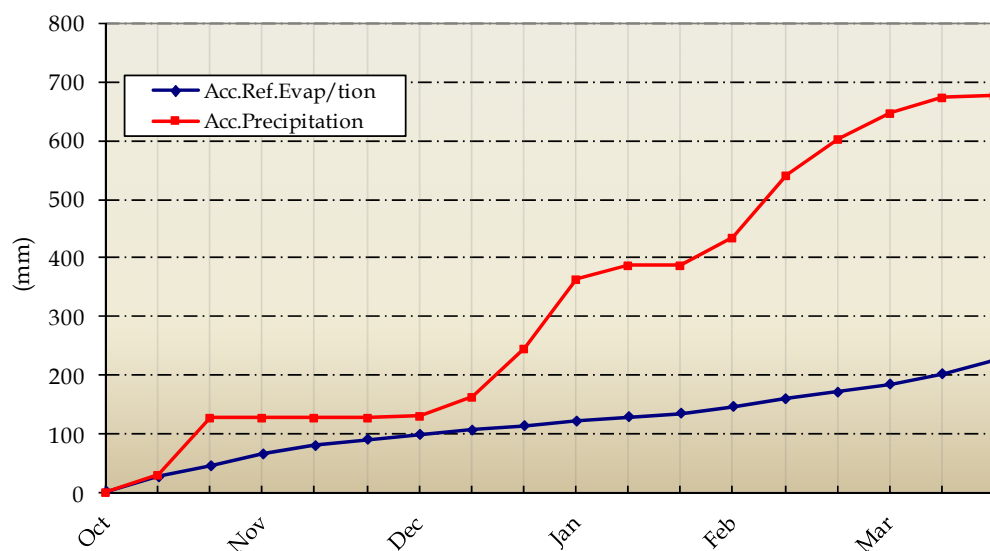
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Agrinio

2nd 10-day period (11-20/03/2012)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	11.0	10.4	13.0	16.4	18.0	19.2	19.0	18.8	20.0	24.0	17.0	18.8	16.2
	Min	7.4	6.0	6.0	-0.4	1.2	2.0	3.0	3.6	3.6	6.0	3.8	5.1	4.7
Relative Humidity	Max	83	94	57	89	96	93	90	97	97	94	89	96	-
	Min	69	46	38	29	37	30	53	56	53	46	46	44	-
Soil Temperature at 10 cm	06 UTC	10.4	9.8	8.6	8.2	8.6	9.0	9.4	10.2	10.6	11.0	9.6	10.5	9.3
	12 UTC	10.2	10.0	10.0	10.0	11.2	11.8	12.0	12.8	13.4	14.0	11.5	12.1	12.6
Sunshine Duration		0.0	0.0	9.2	10.2	10.1	10.6	8.6	10.3	10.0	10.3	7.9	6.7	5.6
Precipitation		4.0										4.0	16.1	28.1
Evaporation		0.2	3.2	3.2	3.2	2.7	3.7	3.0	3.0	-	4.1	-	22.1	29.9
Growing Degrees	5	4.2	3.2	4.5	3.0	4.6	5.6	6.0	6.2	6.8	10.0	54.1	69.8	55.0
	10	0.0	0.0	0.0	0.0	0.0	0.6	1.0	1.2	1.8	5.0	9.6	23.8	12.7

2nd 10-day period (11-20/03/2012)	Previous Year Value	Past Years Mean Value	
Reference Evapotranspiration	22.6	21.7	20.4
Precipitation - Reference Evapotranspiration	-18.6	-5.6	7.7
Number of Rainy Days	1.0	2.0	3.8
Number of Dry Days	2.0	8.0	-

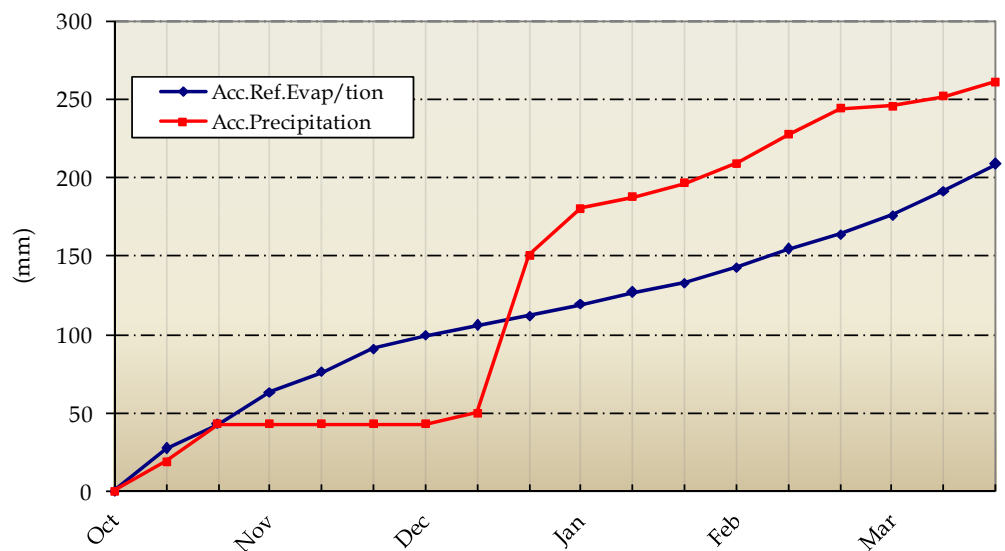
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



2nd 10-day period (11-20/03/2012)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	5.4	6.8	9.0	11.8	11.4	9.6	13.4	16.4	17.4	13.2	11.4	14.0	11.6
	Min	2.6	1.8	3.2	2.0	3.6	1.2	3.4	8.2	11.2	7.0	4.4	4.6	2.9
Relative Humidity	Max	89	93	84	84	93	89	91	97	95	97	91	93	-
	Min	56	69	38	48	69	33	55	65	59	85	58	67	-
Soil Temperature at 10 cm	06 UTC	5.2	4.4	4.4	5.0	7.0	6.0	6.0	7.8	10.4	11.2	6.7	7.6	6.6
	12 UTC	5.4	5.4	5.8	7.4	8.4	8.2	9.0	11.2	13.0	11.0	8.5	9.1	8.9
Sunshine Duration		0.0	1.0	1.5	8.6	0.8	10.4	8.4	8.6	8.6	4.0	5.2	5.4	4.9
Precipitation		5.2	3.1			1.5						9.8	1.3	14.4
Evaporation		6.7	0.2	0.8	0.8	1.5	0.5	2.2	4.8	0.4	3.3	21.2	20.0	21.8
Growing Degrees	5	0.0	0.0	1.1	1.9	2.5	0.4	3.4	7.3	9.3	5.1	31.0	44.4	27.0
	10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.3	4.3	0.1	6.7	9.7	3.4

2nd 10-day period (11-20/03/2012)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	16.9	16.1	18.1
Precipitation - Reference Evapotranspiration	-7.1	-14.8	-3.7
Number of Rainy Days	3.0	2.0	2.2
Number of Dry Days	1.0	10.0	-

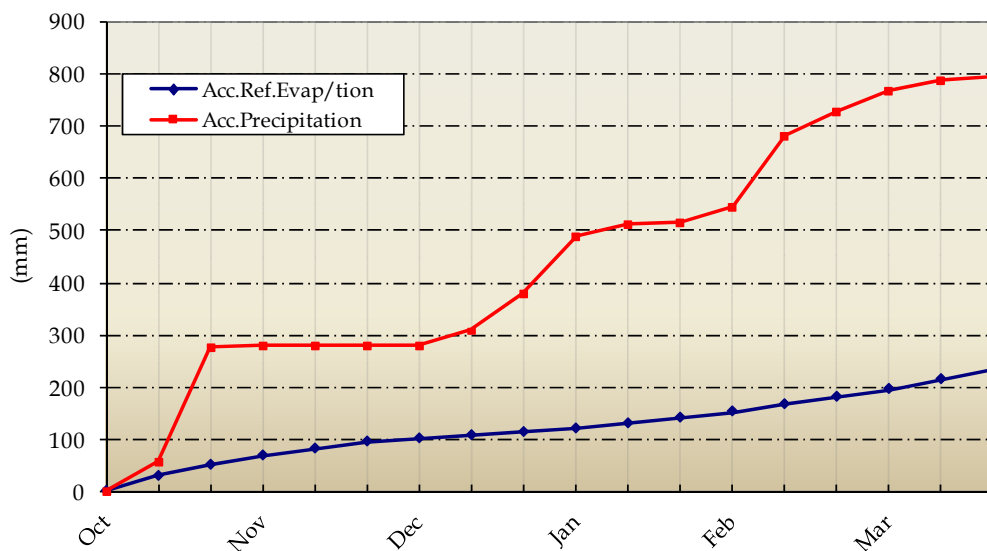
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



2nd 10-day period (11-20/03/2012)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	12.4	9.1	12.6	14.4	15.6	18.0	17.0	16.8	16.4	17.8	15.0	18.3	15.7
	Min	8.4	6.6	4.8	0.8	4.4	3.8	9.0	8.4	6.8	5.8	5.9	7.3	6.3
Relative Humidity	Max	82	89	87	88	94	95	98	97	97	97	92	91	-
	Min	49	64	40	34	62	37	68	71	60	70	56	48	-
Soil Temperature at 10 cm	06 UTC	10.8	9.2	8.2	7.4	8.8	10.0	11.8	12.0	12.2	12.2	10.3	11.3	10.6
	12 UTC	10.4	10.2	11.0	11.6	12.6	14.4	15.2	15.6	16.4	16.0	13.3	14.7	12.8
Sunshine Duration		0.0	0.0	7.5	9.2	9.8	9.5	9.0	8.3	8.7	9.4	7.1	5.9	6.4
Precipitation		2.6	2.7									5.3	43.4	25.8
Evaporation		0.2	0.3	3.4	2.7	4.0	3.5	3.3	1.2	3.5	2.5	24.6	31.5	26.9
Growing Degrees	5	5.4	2.9	3.7	2.6	5.0	5.9	8.0	7.6	6.6	6.8	54.5	78.2	60.4
	10	0.4	0.0	0.0	0.0	0.0	0.9	3.0	2.6	1.6	1.8	10.3	30.2	15.6

2nd 10-day period (11-20/03/2012)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	20.4	20.9	21.0
Precipitation - Reference Evapotranspiration	-15.1	22.5	4.8
Number of Rainy Days	2.0	3.0	3.7
Number of Dry Days	1.0	8.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

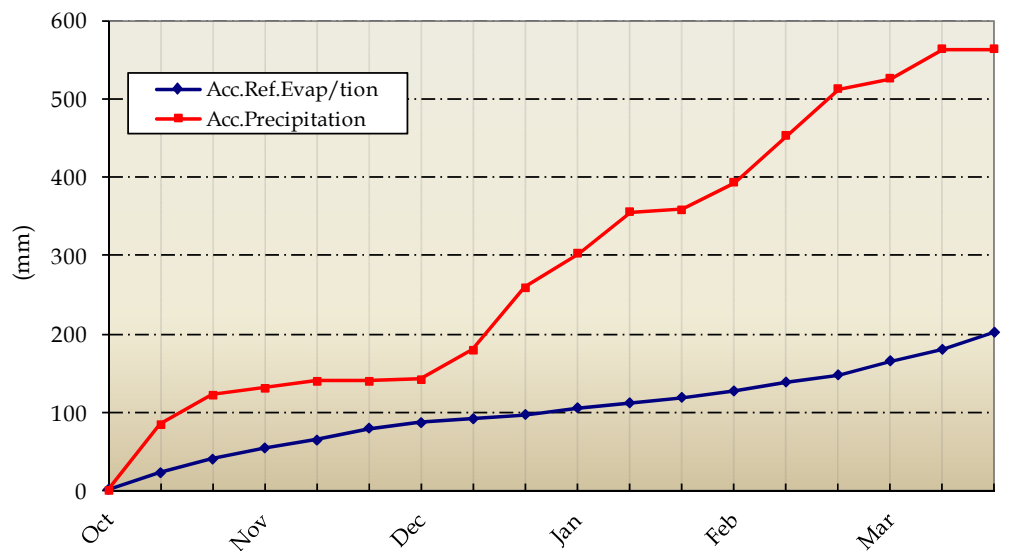


Ioannina

2nd 10-day period (11-20/03/2012)		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	7.6	9.2	14.8	17.2	18.2	16.4	17.8	19.6	23.4	15.4	-	12.6
	Min	4.8	5.2	4.0	-1.2	-1.4	0.2	-0.8	1.0	3.8	2.6	1.8	-	2.7
Relative Humidity	Max	75	66	53	77	92	75	96	97	97	93	82	-	-
	Min	51	38	33	28	36	22	34	35	28	19	32	-	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	6.6
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	8.8
Sunshine Duration		0.0	0.0	5.9	8.7	8.6	8.3	7.9	6.0	6.6	6.6	5.9	-	4.5
Precipitation		0.5										0.5	-	29.5
Evaporation		-	-	-	-	-	-	-	-	-	-	-	-	18.6
Growing Degrees	5	2.2	1.4	1.6	1.8	2.9	4.2	2.8	4.4	6.7	8.0	36.0	-	28.8
	10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7	3.0	4.7	-	3.0

2nd 10-day period (11-20/03/2012)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	21.9	-	16.8
Precipitation - Reference Evapotranspiration	-21.4	-	12.7
Number of Rainy Days	1.0	-	3.4
Number of Dry Days	1.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

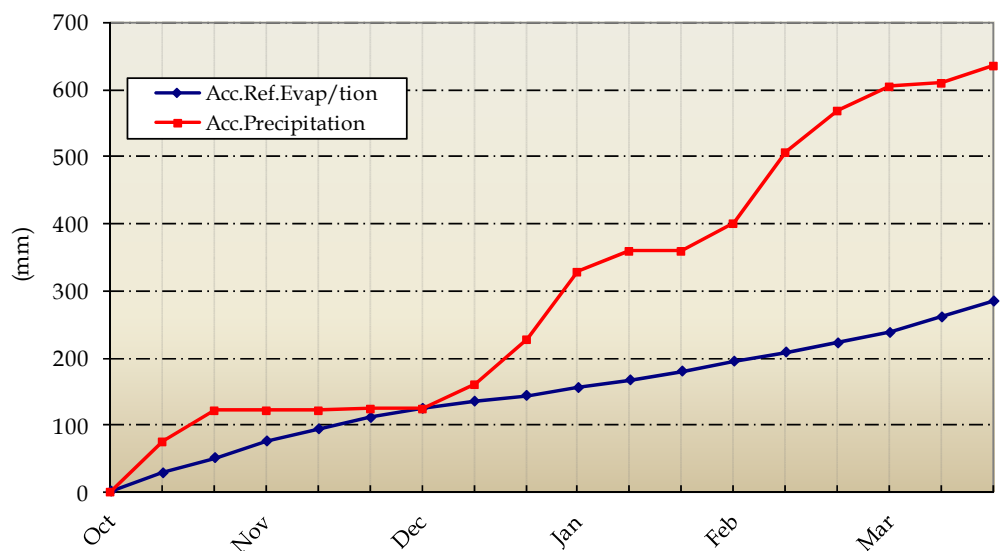


Kalamata

2nd 10-day period (11-20/03/2012)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	16.2	10.0	13.0	15.6	17.6	17.0	18.0	18.4	17.8	18.2	16.2	17.8	16.3
	Min	8.6	5.8	6.2	3.2	2.4	4.6	9.0	6.4	6.6	8.0	6.1	6.5	5.8
Relative Humidity	Max	92	97	70	87	89	91	95	94	97	97	91	96	-
	Min	45	70	40	33	40	50	55	59	59	62	51	52	-
Soil Temperature at 10 cm	06 UTC	12.0	11.0	9.8	9.4	9.4	10.4	12.0	11.4	12.0	12.4	11.0	12.0	10.9
	12 UTC	12.2	10.8	10.8	11.2	11.6	12.6	13.4	13.6	14.0	14.6	12.5	13.4	13.0
Sunshine Duration		0.0	0.0	4.9	10.2	10.3	7.7	7.5	11.0	11.2	11.3	7.4	7.4	6.1
Precipitation		2.9	23.1	1.0								27.0	13.9	22.7
Evaporation		4.6	0.8	9.0	1.2	3.2	3.9	5.7	3.8	2.9	7.3	42.4	29.1	33.5
Growing Degrees	5	7.4	2.9	4.6	4.4	5.0	5.8	8.5	7.4	7.2	8.1	61.3	71.7	60.5
	10	2.4	0.0	0.0	0.0	0.0	0.8	3.5	2.4	2.2	3.1	14.4	24.3	15.1

2nd 10-day period (11-20/03/2012)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	23.8	23.8	21.7
Precipitation - Reference Evapotranspiration	3.2	-9.9	1.0
Number of Rainy Days	3.0	3.0	3.8
Number of Dry Days	4.0	9.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



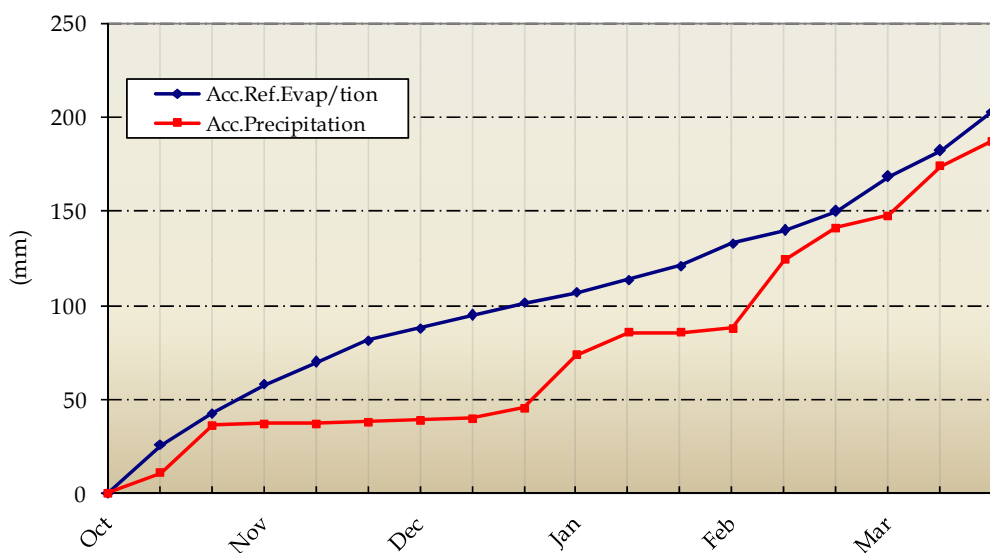


Larisa

2nd 10-day period (11-20/03/2012)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	7.2	7.6	10.4	15.2	16.4	16.8	19.2	21.0	21.4	23.5	15.9	18.1	14.0
	Min	3.6	3.2	3.6	-0.4	1.0	3.2	0.8	3.0	4.8	4.8	2.8	4.5	2.8
Relative Humidity	Max	93	97	93	92	92	87	96	97	97	97	94	95	-
	Min	76	64	39	32	29	30	35	40	36	25	41	49	-
Soil Temperature at 10 cm	06 UTC	6.4	6.4	6.4	6.0	6.4	7.4	8.4	8.8	9.8	10.0	7.6	7.2	8.4
	12 UTC	7.8	7.0	8.0	8.0	8.0	9.0	10.0	10.8	11.4	12.0	9.2	12.2	9.5
Sunshine Duration		0.0	0.0	2.6	8.6	8.3	8.8	10.2	8.7	8.1	9.1	6.4	5.9	5.1
Precipitation		7.8	2.9	2.9								13.6	10.5	13.9
Evaporation		6.6	3.1	3.2	1.6	3.5	2.6	5.4	6.8	0.9	1.5	35.2	28.0	20.7
Growing Degrees	5	0.4	0.4	2.0	2.4	3.7	5.0	5.0	7.0	8.1	9.2	43.2	63.2	36.4
	10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	3.1	4.2	9.3	19.0	5.5

2nd 10-day period (11-20/03/2012)	Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	20.8	21.5
Precipitation - Reference Evapotranspiration	-7.2	-11.0
Number of Rainy Days	3.0	3.1
Number of Dry Days	0.0	8.0

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

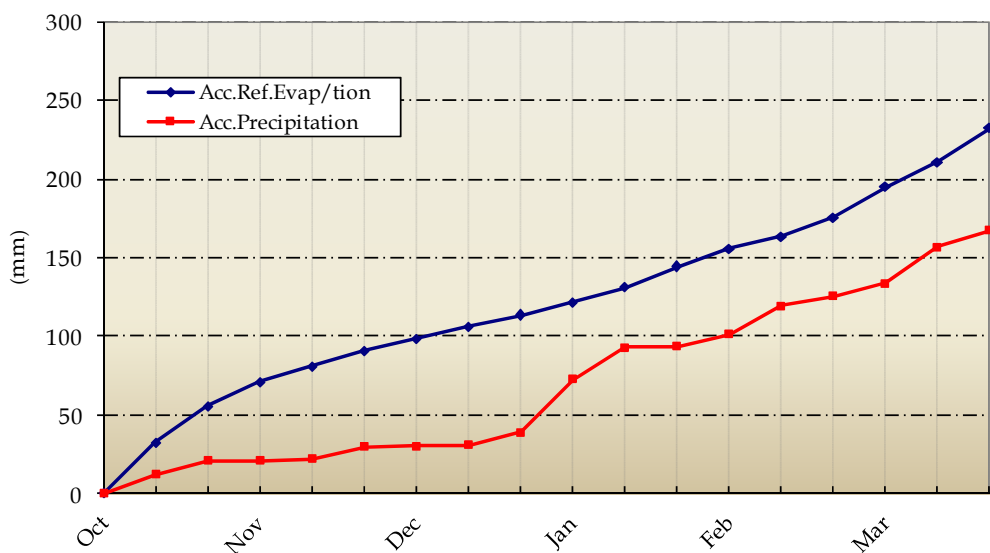


Mikra

2nd 10-day period (11-20/03/2012)		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	9.0	11.0	15.4	14.2	15.0	13.8	16.8	14.0	22.8	13.9	-	13.4
	Min	2.4	4.2	3.6	-0.2	8.6	2.2	4.4	2.6	6.0	6.8	4.1	-	4.2
Relative Humidity	Max	90	87	87	89	58	84	90	93	91	95	86	-	-
	Min	67	57	43	38	40	37	59	56	69	27	49	-	-
Soil Temperature at 10 cm	06 UTC	6.6	6.0	6.4	4.8	8.0	7.4	8.4	8.4	10.4	6.4	7.3	-	8.1
	12 UTC	8.0	6.6	7.8	8.0	11.6	10.0	11.0	11.4	12.4	13.4	10.0	-	10.7
Sunshine Duration		0.0	0.0	1.3	10.6	9.3	10.0	6.8	10.0	5.5	8.0	6.2	-	4.9
Precipitation		7.3	3.3									10.6	-	13.5
Evaporation		4.4	0.7	0.2	3.6	3.8	3.0	4.2	3.2	2.6	4.0	29.7	-	27.0
Growing Degrees	5	0.0	1.6	2.3	2.6	6.4	3.6	4.1	4.7	5.0	9.8	40.1	-	38.9
	10	0.0	0.0	0.0	0.0	1.4	0.0	0.0	0.0	0.0	4.8	6.2	-	5.9

2nd 10-day period (11-20/03/2012)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	21.7	-	20.0
Precipitation - Reference Evapotranspiration	-11.1	-	-6.5
Number of Rainy Days	2.0	-	3.0
Number of Dry Days	0.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



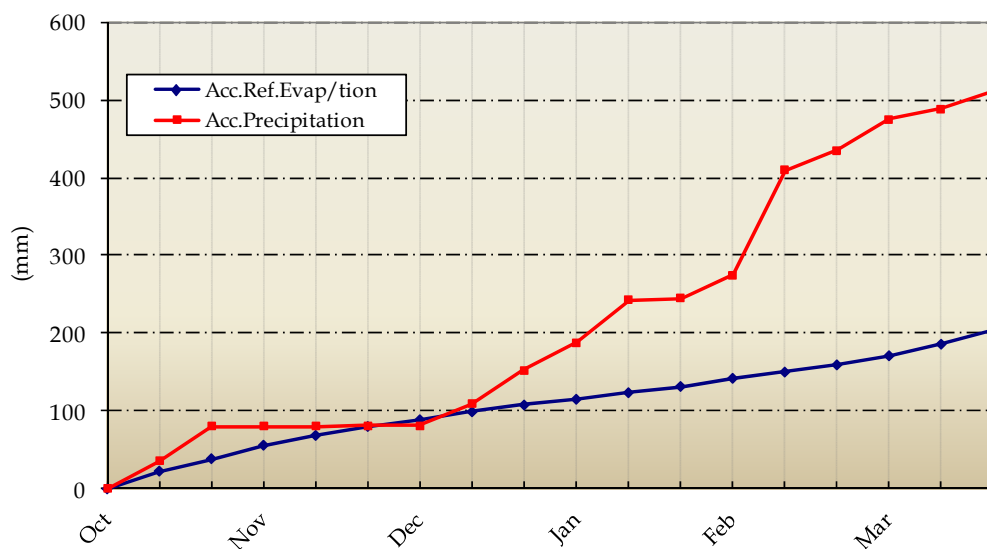


Tripoli

2nd 10-day period (11-20/03/2012)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	6.1	2.8	6.1	11.2	15.2	13.4	17.0	17.4	20.6	21.4	13.1	16.0	12.2
	Min	2.2	0.2	0.6	-2.2	-3.1	-1.6	1.0	-0.9	-0.2	1.4	-0.3	2.6	1.7
Relative Humidity	Max	93	95	85	87	94	92	83	96	95	95	92	95	-
	Min	78	88	65	44	58	83	78	75	54	55	68	39	-
Soil Temperature at 10 cm	06 UTC	6.4	5.2	3.4	2.8	3.4	4.6	5.8	6.4	7.4	8.2	5.4	6.8	6.6
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	10.8	8.1
Sunshine Duration		0.0	0.0	3.1	9.9	8.9	8.8	10.3	9.9	10.2	10.0	7.1	6.5	5.7
Precipitation		7.5	13.0	1.2								21.7	6.3	22.3
Evaporation		0.8	0.9	0.4	2.6	1.9	1.4	2.1	3.6	1.4	4.6	19.7	11.5	20.1
Growing Degrees	5	0.0	0.0	0.0	0.0	1.1	0.9	4.0	3.3	5.2	6.4	20.8	45.5	24.1
	10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.4	1.6	9.7	2.5

2nd 10-day period (11-20/03/2012)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	18.1	20.3	19.5
Precipitation - Reference Evapotranspiration	3.6	-14.0	2.8
Number of Rainy Days	3.0	3.0	4.1
Number of Dry Days	2.0	7.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

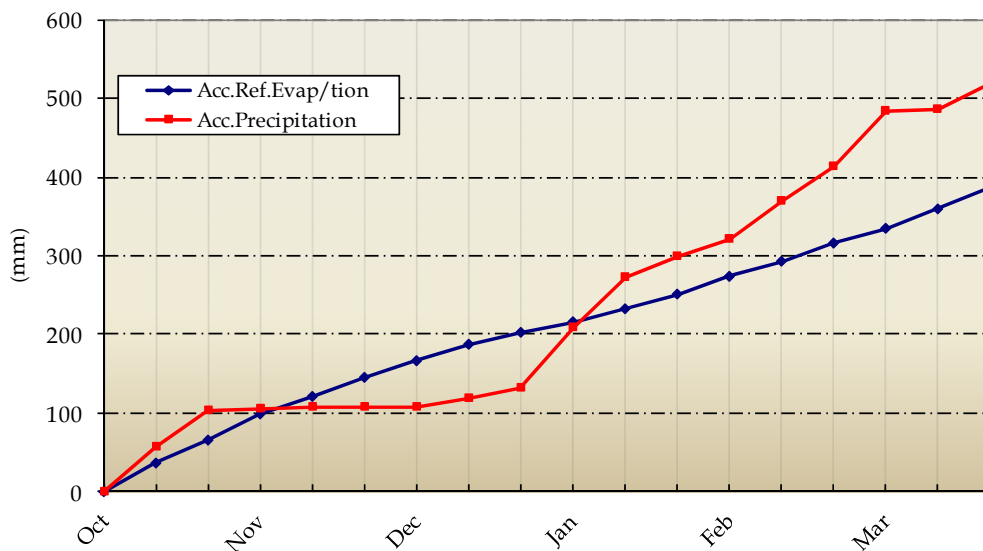


Tympaki

2nd 10-day period (11-20/03/2012)		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	16.6	12.2	13.4	17.0	16.6	16.4	17.0	16.6	17.2	16.3	17.8	16.9
	Min	13.6	10.2	8.0	7.6	3.6	3.4	2.6	4.8	5.8	5.6	6.5	6.8	7.8
Relative Humidity	Max	93	93	95	93	95	95	93	93	93	93	94	96	-
	Min	19	60	65	55	35	29	32	60	58	54	47	43	-
Soil Temperature at 10 cm	06 UTC	14.6	14.8	13.4	10.6	8.8	10.2	9.4	11.0	12.0	12.2	11.7	12.4	13.4
	12 UTC	17.4	17.0	13.2	12.0	14.0	13.4	15.0	16.4	17.4	18.0	15.4	16.1	16.0
Sunshine Duration		5.3	2.3	5.4	4.5	10.5	8.4	10.6	10.6	10.5	10.9	7.9	7.0	6.6
Precipitation			8.4	24.8	0.1							33.3	0.3	17.4
Evaporation		2.6	2.3	2.2	2.4	4.8	3.8	1.8	5.2	2.1	2.5	29.7	28.9	40.0
Growing Degrees	5	12.0	8.4	5.1	5.5	5.3	5.0	4.5	5.9	6.2	6.4	64.3	72.9	73.3
	10	7.0	3.4	0.1	0.5	0.3	0.0	0.0	0.9	1.2	1.4	14.8	25.0	25.5

2nd 10-day period (11-20/03/2012)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	27.0	24.3	24.5
Precipitation - Reference Evapotranspiration	6.3	-24.0	-7.1
Number of Rainy Days	3.0	1.0	2.8
Number of Dry Days	5.0	8.0	-

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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