

# Phytosociological Research Center

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## Worldwide Bioclimatic Classification System

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(Adapted to Synoptical Table 30/08/2017)

VILLAFRANCA DEL BIERZO (ESP LEON) Altitude: 504 m.  
 Latitude: 42°37'N Longitude: 6°48'W  
 Temperature observation period.: 1931-1962 (32)  
 Rainfall observation period....: 1931-1962 (32)

(C/mm)	Ti	Mi	mi	M'i	m'i	Pi	EPI
Jan.	4.80	8.60	0.90	14.20	-4.00	117.0	11.98
Feb.	6.00	11.00	1.00	17.10	-3.10	90.0	16.19
Mar.	9.10	14.30	3.90	21.40	-1.10	106.0	34.54
Apr.	11.50	17.30	5.70	24.90	0.90	63.0	51.37
May.	14.30	20.30	8.30	28.10	3.40	56.0	76.64
Jun.	17.80	24.80	10.80	32.50	6.50	44.0	103.38
Jul.	21.00	28.70	13.20	36.60	7.70	15.0	129.08
Aug.	20.30	27.50	13.20	36.20	8.60	16.0	114.91
Sep.	17.90	24.70	11.00	33.50	6.40	38.0	84.61
Oct.	12.60	18.90	6.30	26.50	1.70	72.0	49.04
Nov.	7.80	12.30	3.30	16.80	-1.80	131.0	22.47
Dec.	4.90	8.60	1.10	14.10	-5.00	153.0	11.69
Year	12.33	18.08	6.56	25.16	1.68	901	705.90

### BIOCLIMATIC INDICES AND DIAGNOSIS

Thermicity index.....(It):	218
Compensated thermicity index.....(Itc):	218
Simple continentality index.....(Ic):	16.2
Diurnality index.....(Id):	15.5
Annual ombrothermic index.....(Io):	6.09
Monthly estival ombrothermic index.....(Ios1):	0.71
Bimonthly estival ombrothermic index.....(Ios2):	0.75
Threemonthly estival ombrothermic index.....(Ios3):	1.27
Fourmonthly estival ombrothermic index.....(Ios4):	1.78
Annual ombro-evaporation index.....(Ioe):	0.37
Annual positive temperature.....(Tp):	1480
Annual negative temperature.....(Tn):	0
Estival temperature.....(Ts):	591
Positive precipitation.....(Pp):	901

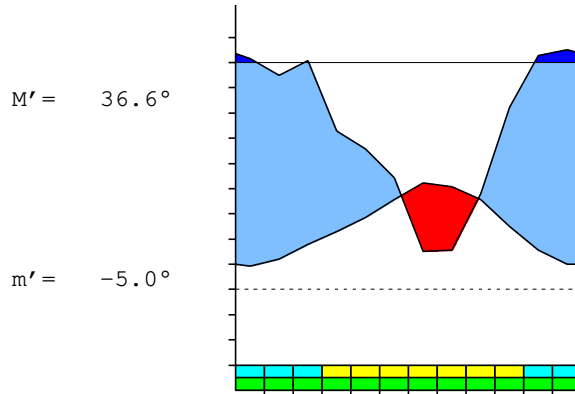
N. of	P>4T	P:2T-4T	PT-2T	P<T	T<0
Months	7	3	0	2	0

Latitudinal Belt...: Low eutemperate  
 Continentality.....: Oceanic - Low Euoceanic  
 Bioclimate.....: MEDITERRANEAN PLUVISEASONAL-OCEANIC  
 Bioclimatic Belt...: LOW SUPRAMEDITERRANEAN LOW HUMID

VILLAFRANCA DEL BIERZO (ESP LEON)

504 m

P= 901      42° 37'N      6° 48'W      32/32 y.  
 T= 12.3°    Ic= 16.2      Tp= 1480      Tn= 0  
 m= 0.9°      M= 8.6°      Itc= 218      Io= 6.1



MEDITERRANEAN PLUVISEASONAL-OCEANIC  
 LOW SUPRAMEditerranean LOW HUMID

WATER INDEX CARD VILLAFRANCA DEL BIERZO (ESP LEON)

Altitude: 504 m.      Latitude: 42° 37'N

(C/mm)	T	PE	P	VR	R	RE	DF	SP	DR	HC
Jan.	4.8	12	117	0	100	12	0	105	92	8.7
Feb.	6.0	16	90	0	100	16	0	74	83	4.5
Mar.	9.1	35	106	0	100	35	0	71	77	2.0
Apr.	11.5	51	63	0	100	51	0	12	44	0.2
May.	14.3	77	56	-21	79	77	0	0	22	-0.2
Jun.	17.8	103	44	-59	20	103	0	0	11	-0.5
Jul.	21.0	129	15	-20	0	35	94	0	6	-0.8
Aug.	20.3	115	16	0	0	16	99	0	3	-0.8
Sep.	17.9	85	38	0	0	38	47	0	1	-0.5
Oct.	12.6	49	72	23	23	49	0	0	1	0.4
Nov.	7.8	22	131	77	100	22	0	31	16	4.8
Dec.	4.9	12	153	0	100	12	0	141	79	12.0
Year	12.3	706	901	*	*	466	240	435	435	*

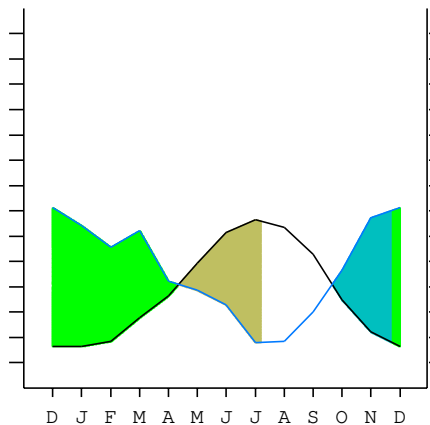
R = Reserve    VR = Variation of the reserve    RE = Real evapotranspiration  
 DR = Drainage    HC = Humidity coefficient    DF = Deficit    SP = Superavit

VILLAFRANCA DEL BIERZO (ESP LEON)

42°37'N    6°48'W    504 m 32/32 y.

T= 12.3    Ic= 16.2    MEDITERRANEAN PLUVISEASONAL-OCEANIC  
 m= 0.9    Tp= 1480    LOW SUPRAMEditerranean  
 M= 8.6    Tn= 0    LOW HUMID  
 M' = 36.6    Itc= 218  
 m' = -5.0    Io= 6.1  
 P= 901    mm    ———  
 PE= 706    mm    ———

Imbibing	21 Sep.
Saturation	22 Nov.
Reserve Use	11 Apr.
Deficit	6 Jul.



VILLAFRANCA DEL BIERZO (ESP LEON)

Latitude: 42°37'N Longitude: 6°48'W Altitude: 504 m

SUMMARY OF RIVAS-MARTINEZ CLASSIFICATION

Continental Index [B2b]  
 + Type .....: B. Oceanic  
 + Subtype .....: 2. Euoceanic  
 + Variant .....: b. Low

Thermic types [B1.B4]  
 + Latitudinal zone ....: B. Temperate  
 + Latitudinal belt ....: 1. Low eutemperate  
 + Thermic type .....: B. Temperate  
 + Thermic subtype .....: 4. Temperate

Bioclimatic types [B8.4b.7b]  
 + Macrobioclimate .....: B. MEDITERRANEAN  
 + Bioclimate .....: 8. PLUVISEASONAL-OCEANIC  
 + Bioclimatic variant .:  
 + Thermic type.....: 4. SUPRAMEDITERRANEAN  
 + Thermic subtype.....: b. LOW  
 + Ombrothermic type ...: 7. HUMID  
 + Ombrothermic subtype : b. LOW  
 Bioclimatic Classification .....: Mehc.Sme.Hum

VILLAFRANCA DEL BIERZO (ESP LEON)

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PRECIPITATION PARAMETERS

Warmest semester of the year.....(Pss): 241  
 Coldest semester of the year.....(Psw): 660  
 Warmest four months period of the year.....(Pcm1): 113  
 Following warmest four months period.....(Pcm2): 473  
 Positive precipitation dryest 3 months.....(Ppd): 69  
 Positive precipitation dryest 2 months.....(Ppd2): 31  
 Positive precipitation dryest 1 month.....(Ppd1): 15  
 Positive precipitation warmest 3 months.....(Pps): 69  
 Positive precipitation warmest 2 months.....(Pps2): 31  
 Positive precipitation warmest 1 month.....(Pps1): 15  
 Positive precipitation coldest 3 months.....(Ppw): 360  
 Positive precipitation coldest 2 months.....(Ppw2): 270  
 Positive precipitation coldest 1 month.....(Ppw1): 117

Seasons	Winter Tr1-W	Spring Tr2-P	Summer Tr3-S	Automn Tr4-F
Rainfall	360	225	75	241

Seasonal rainfall rhythms: W > F > P > S

VILLAFRANCA DEL BIERZO (ESP LEON)

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TEMPERATURE PARAMETERS

Average warmest month [T].....(Tmax): 21.0  
 Average coldest month [T].....(Tmin): 4.8  
 Maximum temp. warmest month [M].....(Tmmax): 28.7  
 Minimum temp. coldest month [m].....(Tmmin): 0.9  
 Absolute Max.temp. warmest month [M'].....(Tamax): 36.6  
 Absolute Min.temp. coldest month [m'].....(Tamin): -5.0  
 First warmest contrasted month [M].....(Tcmax): 28.7 (7)  
 First coldest contrasted month [m].....(Tcmin): 13.2 (7)  
 Estival temperature.....(Ts): 591  
 Positive temperature dryest 3 months.....(Tpd): 592  
 Positive temperature dryest 2 months.....(Tpd2): 413  
 Positive temperature dryest 1 month.....(Tpd1): 210  
 Positive temperature warmest 3 months.....(Tps): 592  
 Positive temperature warmest 2 months.....(Tps2): 413  
 Positive temperature warmest 1 month.....(Tps1): 210  
 Positive temperature coldest 3 months.....(Tpw): 157  
 Positive temperature coldest 2 months.....(Tpw2): 97  
 Positive temperature coldest 1 month.....(Tpw1): 48

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SEASONAL PARAMETERS

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Warmest semester...(Sms)					o	o	o	o	o	o		
Dryest semester....(Smd)				o	o	o	o	o	o			
Warmest 4 months...(Cm1)						o	o	o	o			
Dryest 4 months....(Cmd)						o	o	o	o			
Vegetation Activity(Pav)	o	o	o	o	o	o	o	o	o	o	o	o
Ultragelid...[M' <=0] (Pf)												
Hypergelid...[M <=0] (Pf)												
Gelid.....[T <=0] (Pf)												
Subgelid.....[m <=0] (Pf)												
Pregelid.....[m' <=0] (Pf)	o	o	o								o	o
Agelid.....[m' > 0] (Pf)				o	o	o	o	o	o	o		
HiperAgelid..[all>0] (Pf)				o	o	o	o	o	o	o		

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OMBROTHERMIC PARAMETERS

Annual aridity index.[PE/P].....(Iar): 0.78  
 Mediterranean index of July.[PE/P].....(Im1): 8.61  
 Mediterranean index of July & August.....(Im2): 7.87  
 Mediterranean index of June, July & August....(Im3): 4.63

Months	Dec.	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.
Pp(x10)	1530	1170	900	1060	630	560	440	150	160	380	720	1310
Tp	49	48	60	91	115	143	178	210	203	179	126	78
Io (Iom)	31.2	24.4	15.0	11.6	5.48	3.92	2.47	0.71	0.79	2.12	5.71	16.8
Seasons	Winter			Spring			Summer			Autumn		
Pp(x10)/Tp	3600 / 157			2250 / 349			750 / 591			2410 / 383		
Io (Iot)	22.93			6.447			1.269			6.292		
Semesters	December-May						June-November					
Pp(x10)/Tp	5850 / 506						3160 / 974					
Io (Iosm)	11.56						3.244					

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Aridity Value Index (AVI)

[10xPP/TP=IO]: 9010/1480=6.09 **There is No Yearly Aridity**

Months	Dec.	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.
Pp [P*10]	1530	1170	900	1060	630	560	440	150	160	380	720	1310
Tp [T*10]	49	48	60	91	115	143	178	210	203	179	126	78
Iom [Pp/Tp]	\$\$	\$\$	\$\$	\$\$	548	392	247	71	79	212	571	\$\$
Avm [200-Iom]	***	***	***	***	***	***	***	129	121	***	***	***
Seasons	Winter			Spring			Summer			Autumn		
Pp / Tp	3600 / 157			2250 / 349			750 / 591			2410 / 383		
Iot [Pp/Tp]	2293			645			127			629		
Avs E[Avm<200]	***			***			***			***		
Strong upper arid [2]												

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BIOCLIMATIC INDICES I

CI of Supan (1884) [Tmax-Tmin] .....(Sp): 16.20  
 CI of Gorezinski (1920) [1.7\*Sp/sin(Lat)-20.4] .....: 20.27  
 CI of Conrad (1946) [1.7\*Sp/sin(Lat+10)-14] .....: 20.66  
 + Oceanic (20<CI<40)  
 CI of Currey (1974) [CI=Sp/(1+Lat/3)] .....: 1.07  
 + Oceanic (0.6<CI<1.1)  
 Rainfall Index of Lang (1925) [R=P/T] .....: 73.05  
 + Temperate warm (100>R>60)  
 Aridity Index of Martonne (1926) [Ia=P/(T+10)] .....: 40.34  
 + Humid (60>Ia>30)  
 I of Emberger (1930) [Q=100\*P/(Tmax<sup>2</sup>-Tmin<sup>2</sup>)] .....: 109.49  
 + Humid (Q>90)  
 I of Dantin & Revenga (1940) [DR=100\*T/P] .....: 1.37  
 + Humid (2>DR>0)  
 Aridity Index of UNEP [I=P/PE] .....: 1.28  
 + Humid (I>0.65)  
 Potential Erosion I of Fournier (1960) [K=Pi<sup>2</sup>/P].....: 25.98  
 + Very low (K<60)

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BIOCLIMATIC INDICES II

Bioclimatic classification of Gaussen & Bagnouls (1957)  
 + Climate .....: A. Warm and temperate warm  
 + Region .....: 3. Termoxeroteric (Mediterranean warm)  
 + Thermic type: 4. Mesothermic

Thornthwaite (1948)												
	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
P-E ratio	0.80	0.57	0.61	0.32	0.26	0.18	0.05	0.05	0.15	0.36	0.81	1.08
T-E ratio	2.16	2.70	4.10	5.18	6.44	8.01	9.45	9.13	8.05	5.67	3.51	2.21
Precipitation-effectiveness: 52.34						Temperature-efficiency .....: 66.60						
Moisture Index [MI=100*(P-PE)/PE] .....: 27.64 + B1.Humid low-humid (20<MI<40)												
Index of dryness [DI=100*d/PE] .....: 33.94 + Strong deficit (33.3<DI)												
Index of humidity [HI=100*s/PE] .....: 61.58 + Strong surplus (20<HI)												
Potential Evapotranspiration PE .....: 705.90 + First mesothermic (570<PE<712)												

