

Table S4. Parameterization for each phenological model for the cultivars analyzed in the study. TU and TT indicate the chilling and heat requirements (°C days), respectively, and RMSE the errors in the estimation comparing observed and simulated values.

Code	Cultivar	Flowering C+H			Flowering H		Ripening	
		TU	TT	RMSE	TT	RMSE	TT	RMSE
1	Abbadi Shalal	274	334	5.0	601	5.7		
2	Abou Satl Mohazam	290	332	5.7	579	6.6	5480	17.3
3	Adramitini or Ayvalik	271	334	5.0	589	5.5	5457	22.3
4	Alameño Blanco	290	332	4.9	578	5.7		
5	Alameño de Cabra	270	322	4.7	572	4.9	5454	16.0
6	Alameño de Montilla	290	332	5.9	584	5.0		
7	Alfafara	271	334	5.6	595	4.6	5869	19.3
8	Aloreña de Iznalloz	274	322	4.8	576	5.6		
9	Amygdalolia Nana	284	324	5.4	580	5.4		
10	Arbequina	290	324	4.5	568	5.8	5835	21.0
11	Argudell	290	332	5.3	591	5.8		
12	Arroniz	290	309	4.5	560	6.7		
13	Ascolana Tenera	270	343	5.1	611	4.5		
14	Asnal	270	343	4.7	603	4.3		
15	Azapa	290	332	5.8	589	4.3		
16	Azul	271	334	4.7	586	5.5	5791	15.0
17	Azulejo	290	332	5.2	575	5.4	5620	23.6
18	Barnea	270	343	4.9	606	4.6		
19	Beladi	290	332	4.5	591	5.7	5791	12.2
20	Belluti	290	332	4.6	587	6.3	5744	15.2
21	Blanqueta	256	344	5.5	615	5.0	5624	19.8
22	Bolvino	271	334	4.8	599	4.8	5389	15.2
23	Borriolenca	288	291	5.6	506	5.0	5663	25.7
24	Bouteillan	271	321	5.5	565	4.8	6011	15.8
25	Buidiego	290	332	5.7	577	4.1		
26	Caballo	270	343	4.7	612	5.0	5764	9.2
27	Callosina	290	332	5.7	579	4.7	5700	20.1
28	Canetera	288	291	4.9	523	4.8	5693	16.9
29	Caninese						5834	17.4
30	Cañivano Negro	270	322	4.8	581	5.6	6026	24.7
31	Carrasqueño de Alcaudete	270	343	4.5	593	3.7		
32	Carrasqueño de la Sierra	271	334	4.1	596	4.8		
33	Carrasquillo	270	343	5.1	609	4.6		
34	Changlot Real	271	334	5.8	584	3.7	5709	15.9
35	Chetoui	290	332	6.4	570	4.6		
36	Cipresino	270	343	4.9	609	4.2		
37	Corbella	270	322	4.6	570	5.0	5440	10.9
38	Cornicabra de Jerez Caballeros	290	332	4.9	579	5.9	5811	21.1

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39	Cornicabra de Mérida	271	334	3.9	591	4.6		
40	Curivell	304	319	5.7	550	6.2	5467	16.4
41	Datilero	271	334	3.8	595	5.2		
42	Dokkar	271	349	3.9	622	5.4	5416	12.1
43	Dulzal de Carmona	271	334	5.3	590	4.1	5644	14.5
44	Empeltre	304	319	5.0	553	5.0	5506	16.8
45	Escarabajillo	290	309	5.1	555	6.2	5326	13.8
46	Escarabajuelo de Atarfe	271	334	4.2	590	4.8	5723	11.9
47	Escarabajuelo de Posadas	274	334	4.9	584	5.4	5999	22.8
48	Farga	284	305	4.3	535	4.9		
49	Figueretes	284	305	5.2	531	5.9	5120	15.9
50	Forastera de Tortosa	290	309	5.0	542	5.2		
51	Frantoio	271	334	4.7	589	5.1	5644	18.9
52	Fulla de Salze	256	312	5.1	545	4.2	5339	10.8
53	Gemlik	274	334	5.2	587	5.8	5388	17.9
54	Genovesa	290	332	5.3	584	6.0	5333	19.7
55	Gerboui	274	322	4.6	564	5.1	6034	19.7
56	Gordal de Granada	271	334	4.1	589	4.9	5734	13.2
57	Gordal de Vélez Rubio	270	343	4.9	609	5.1	5856	19.9
58	Gordal Sevillana	271	334	5.8	593	4.1		
59	Grosal Vimbodí	290	332	4.5	586	6.1		
60	Hojiblanca	271	334	4.4	596	5.4	5834	14.0
61	Istarska Bjelica	271	334	4.3	588	5.2		
62	Itrana	270	343	3.8	620	5.3		
63	Jabaluna	290	332	4.4	577	4.7	5879	13.2
64	Jaljali	270	343	5.2	599	5.4	5533	24.4
65	Jaropo	271	334	4.7	586	4.6		
66	Joanenca	290	332	4.9	598	6.9	5516	12.5
67	Kalamon	271	334	4.0	611	5.1	5407	10.6
68	Kolybada	271	334	4.3	593	4.6		
69	Koroneiki	290	319	4.8	562	5.2		
70	Lastovka	304	319	4.0	549	5.3	5790	13.2
71	Leccino	270	343	3.6	606	4.4	5193	5.8
72	Lechín de Granada	270	343	4.9	612	4.4	5865	16.0
73	Lechín de Sevilla	290	332	4.8	576	5.5	5446	14.1
74	Lentisca	270	343	5.0	612	5.5	5787	15.9
75	Limoncillo	270	322	3.8	582	5.7		
76	Llorón de Atarfe	270	322	4.9	570	5.5		
77	Llumeta	271	321	5.2	552	4.6		
78	Loaime	270	343	5.3	598	4.1		
79	Lucio	271	334	4.8	595	5.5		
80	Lucques	290	332	5.0	576	5.6	5495	17.9
81	Machorrón	271	334	4.4	596	4.9		
82	Madural / Cordovil de Serpa	270	343	4.3	608	4.5	5861	15.3
83	Mahati1010	304	319	5.4	550	6.2		

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84	Mahati846	290	332	5.7	606	6.6		
85	Majhol1059	271	334	5.1	595	5.2	5345	17.8
86	Majhol152	290	332	5.3	584	4.3	5947	14.0
87	Manzanilla Cacereña	284	324	4.9	570	4.4	5611	16.9
88	Manzanilla de Abia	290	332	6.4	571	6.2		
89	Manzanilla de Agua	290	332	4.2	579	5.4	5749	12.9
90	Manzanilla de Almería	270	322	4.5	571	4.9		
91	Manzanilla de Hellín	290	332	4.6	584	5.4		
92	Manzanilla de Sevilla	271	334	4.5	583	5.2	5679	19.7
93	Manzanilla Prieta	290	332	4.9	581	5.4	5544	19.8
94	Maurino	270	343	4.0	599	4.6	5457	17.0
95	Mavreya	290	332	4.1	592	5.3	5123	10.4
96	Menya	290	332	4.4	581	6.3	5230	11.4
97	Meski	290	332	5.2	581	5.1	5555	11.1
98	Mollar Basto	290	332	4.6	584	5.4	5865	18.1
99	Mollar de Cieza	274	322	5.2	575	5.3	5521	11.0
100	Moraiolo	270	343	4.0	614	5.6	5518	15.1
101	Morisca	270	343	5.1	608	4.1	5859	14.4
102	Morona	271	334	4.9	599	4.7		
103	Negrillo de Arjona						5841	14.7
104	Negrillo de la Carlota	274	334	5.4	594	5.2		
105	Negrillo Redondo	271	334	4.9	594	3.7		
106	Nevado Azul	290	332	5.2	579	4.8	5512	16.8
107	Nevado Rizado	271	334	4.9	599	5.4		
108	Ocal	284	324	5.0	577	5.4	5853	20.0
109	Olivo de Mancha Real	274	322	5.2	583	6.6		
110	Olivo de Maura	271	334	5.5	599	5.2		
111	Palomar	270	308	4.7	548	5.2	5686	17.5
112	Pavo	270	322	5.0	582	5.6	5604	9.9
113	Pequeña de Casas Ibañez	271	334	5.0	589	4.9	5420	16.1
114	Perafort	290	332	4.5	583	5.9	5513	23.4
115	Picholine Marocaine	274	334	4.7	584	5.2	5933	18.1
116	Pico Limón de Grazalema	274	322	4.3	566	4.7		
117	Picual	270	343	5.4	611	5.0	5823	15.4
118	Picudo	271	334	4.4	597	5.5	5811	16.5
119	Plementa Bjelica	270	343	5.1	590	5.0		
120	Racimal de Jaén	271	334	4.1	596	5.1		
121	Real Sevillana	271	334	4.6	594	4.3		
122	Rechino	290	332	5.2	589	4.9	5717	15.1
123	Redondilla de Grazalema	274	334	4.7	602	6.1		
124	Rosciola	270	322	4.8	567	4.4		
125	Safrwai	270	322	4.9	571	4.9		
126	Salonenque	274	322	5.1	558	4.5	5515	23.4
127	Sandalio	290	332	4.6	596	5.6	5686	15.2
128	Sayfi	290	324	5.2	567	6.0		

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129	Sevillana de Abila	290	332	5.3	588	5.3		
130	Sevillano de Jumilla	271	334	4.5	581	5.2	5773	19.4
131	Shami	290	332	4.7	583	6.0	5777	17.4
132	Sinop	271	334	4.3	597	5.8		
133	Sollana	290	332	4.8	583	5.9	5608	12.5
134	Sorani	290	324	4.9	570	6.4		
135	Tempranillo de Lucena	274	322	5.1	565	5.2	5398	17.4
136	Tempranillo de Yeste	270	322	4.9	571	5.0		
137	Toruno	290	332	4.0	594	5.6		
138	Ulliri i Kuq	270	343	5.6	624	4.7		
139	Vallesa	288	291	4.0	532	5.3		
140	Varudo	271	334	4.7	596	5.8	5941	21.2
141	Vera	313	319	6.2	534	6.3		
142	Verdale	290	319	5.1	562	5.3		
143	Verde Verdelho	290	332	5.1	590	6.4	5542	13.9
144	Verdial de Badajoz	290	319	5.0	565	5.4	5881	18.9
145	Verdial de Cádiz	270	322	5.2	570	4.2		
146	Verdial de Huévar	270	343	5.2	606	5.0		
147	Verdiell	271	334	4.6	590	4.3	5518	10.2
148	Villalonga	290	332	5.3	578	5.0	5714	17.0
149	Vinyols	290	332	4.5	583	5.9	5643	11.4
150	Zalmati	274	322	5.2	570	6.1	5352	10.1