

**Table S1. Assessed climate variables over the study period (2002-2020)**

Variable	p.Val.with.Time	p.Val.with.SOS	Corr.Coeff.	Case
CH T <sub>base</sub> = 7.2 FM	0.0424**	0.0045***	0,6211	Case1
GDD T <sub>base</sub> = 2 FM	0.0358**	0.0045***	-0,621	Case1
GDD T <sub>base</sub> = 2 JFM	0.0358**	0.0056***	-0,6095	Case1
CH T <sub>base</sub> = 7.2 JFM	0.0358**	0.006***	0,6059	Case1
GDD T <sub>base</sub> = 1 FM	0.0252**	0.006***	-0,6055	Case1
GDD T <sub>base</sub> = 1 JFM	0.0252**	0.0078***	-0,5902	Case1
GDD T <sub>base</sub> = 0 FM	0.0143**	0.0079***	-0,5898	Case1
GDD T <sub>base</sub> = 0 JFM	0.0252**	0.0107**	-0,5708	Case1
CH T <sub>base</sub> = 7.2 DJFM	0.0424**	0.0316**	0,4939	Case1
T <sub>mean</sub> A	0.0209**	0.0419**	-0,4707	Case1
GDD T <sub>base</sub> = 5 JFMA	0.1617	0.0001***	-0,7892	Case2
GDD T <sub>base</sub> = 4 JFMA	0.1237	0.0001***	-0,7888	Case2
GDD T <sub>base</sub> = 6 JFMA	0.2939	0.0001***	-0,7854	Case2
GDD T <sub>base</sub> = 4 FMA	0.1417	0.0001***	-0,7846	Case2
GDD T <sub>base</sub> = 3 MA	0.1617	0.0001***	-0,7844	Case2
GDD T <sub>base</sub> = 4 MA	0.1837	0.0001***	-0,7835	Case2
GDD T <sub>base</sub> = 5 FMA	0.2342	0.0001***	-0,7832	Case2
GDD T <sub>base</sub> = 3 JFMA	0.0931	0.0001***	-0,7825	Case2
GDD T <sub>base</sub> = 2 MA	0.1417	0.0001***	-0,7824	Case2
GDD T <sub>base</sub> = 3 FMA	0.1237	0.0001***	-0,7809	Case2
GDD T <sub>base</sub> = 5 MA	0.1837	0.0001***	-0,7803	Case2
GDD T <sub>base</sub> = 6 FMA	0.2939	0.0001***	-0,7788	Case2
GDD T <sub>base</sub> = 1 MA	0.1417	0.0001***	-0,7782	Case2
GDD T <sub>base</sub> = 7 JFMA	0.2939	0.0001***	-0,7779	Case2
GDD T <sub>base</sub> = 6 MA	0.2079	0.0001***	-0,7756	Case2
GDD T <sub>base</sub> = 0 MA	0.1837	0.0001***	-0,7737	Case2
GDD T <sub>base</sub> = 2 FMA	0.0931	0.0001***	-0,7728	Case2
GDD T <sub>base</sub> = 7 FMA	0.3273	0.0001***	-0,7717	Case2
GDD T <sub>base</sub> = 2 JFMA	0.0689	0.0001***	-0,7714	Case2
GDD T <sub>base</sub> = 8 JFMA	0.2342	0.0001***	-0,7687	Case2
GDD T <sub>base</sub> = 7 MA	0.1837	0.0001***	-0,7685	Case2
GDD T <sub>base</sub> = 8 FMA	0.2939	0.0001***	-0,7632	Case2
GDD T <sub>base</sub> = 1 FMA	0.0802	0.0002***	-0,7615	Case2
GDD T <sub>base</sub> = 8 MA	0.2342	0.0002***	-0,7604	Case2
GDD T <sub>base</sub> = 1 JFMA	0.0589	0.0002***	-0,7565	Case2
GDD T <sub>base</sub> = 0 FMA	0.0501	0.0002***	-0,7491	Case2

GDD T <sub>base</sub> = 0 JFMA	0.0501	0.0003***	-0,7404	Case2
GDD T <sub>base</sub> = 0 A	0.2342	0.0004***	-0,7259	Case2
GDD T <sub>base</sub> = 1 A	0.2342	0.0005***	-0,7236	Case2
GDD T <sub>base</sub> = 2 A	0.2629	0.0005***	-0,7203	Case2
GDD T <sub>base</sub> = 3 A	0.3273	0.0006***	-0,7161	Case2
GDD T <sub>base</sub> = 4 A	0.3273	0.0006***	-0,7112	Case2
GDD T <sub>base</sub> = 5 A	0.363	0.0007***	-0,7075	Case2
GDD T <sub>base</sub> = 6 A	0.4011	0.0007***	-0,7056	Case2
GDD T <sub>base</sub> = 8 A	0.3273	0.0007***	-0,7052	Case2
GDD T <sub>base</sub> = 7 A	0.4011	0.0008***	-0,7048	Case2
CH T <sub>base</sub> = 7.2 M	0.0931	0.0028***	0,6461	Case2
GDD T <sub>base</sub> = 5 FM	0.0931	0.0028***	-0,6457	Case2
GDD T <sub>base</sub> = 4 FM	0.0689	0.003***	-0,6431	Case2
GDD T <sub>base</sub> = 6 FM	0.1417	0.003***	-0,6431	Case2
GDD T <sub>base</sub> = 5 JFM	0.0931	0.0031***	-0,6407	Case2
GDD T <sub>base</sub> = 6 JFM	0.0931	0.0032***	-0,64	Case2
GDD T <sub>base</sub> = 4 JFM	0.1075	0.0034***	-0,6358	Case2
GDD T <sub>base</sub> = 3 FM	0.0589	0.0035***	-0,6343	Case2
GDD T <sub>base</sub> = 7 FM	0.2079	0.0036***	-0,634	Case2
GDD T <sub>base</sub> = 7 JFM	0.1237	0.0037***	-0,6321	Case2
GDD T <sub>base</sub> = 6 M	0.1837	0.0037***	-0,6318	Case2
GDD T <sub>base</sub> = 5 M	0.1837	0.0037***	-0,6318	Case2
GDD T <sub>base</sub> = 4 M	0.1237	0.004***	-0,6273	Case2
GDD T <sub>base</sub> = 3 JFM	0.0501	0.0042***	-0,6249	Case2
GDD T <sub>base</sub> = 7 M	0.1837	0.0043***	-0,6241	Case2
GDD T <sub>base</sub> = 8 FM	0.2629	0.0046***	-0,6202	Case2
GDD T <sub>base</sub> = 3 M	0.1237	0.0047***	-0,6197	Case2
GDD T <sub>base</sub> = 8 JFM	0.1417	0.0047***	-0,6187	Case2
GDD T <sub>base</sub> = 8 M	0.2629	0.0056***	-0,6099	Case2
GDD T <sub>base</sub> = 2 M	0.1075	0.0056***	-0,6096	Case2
GDD T <sub>base</sub> = 1 M	0.0931	0.0069***	-0,5973	Case2
GDD T <sub>base</sub> = 0 M	0.1075	0.0084***	-0,5859	Case2
GDD T <sub>base</sub> = 3 F	0.1075	0.0387**	-0,4774	Case2
GDD T <sub>base</sub> = 4 F	0.1617	0.0399**	-0,4749	Case2
GDD T <sub>base</sub> = 2 F	0.0689	0.0414**	-0,4719	Case2
GDD T <sub>base</sub> = 1 F	0.0931	0.0463**	-0,4623	Case2
GDD T <sub>base</sub> = 5 F	0.1837	0.0476**	-0,4598	Case2

GDD T <sub>base</sub> = 0 F	0.0802	0.0529	-0,4505	Case3
T <sub>mean</sub> FMA	0.1237	0.0581	-0,442	Case3
GDD T <sub>base</sub> = 6 F	0.2629	0.0616	-0,4366	Case3
CH T <sub>base</sub> = 7.2 F	0.1617	0.076	0,4166	Case3
T <sub>mean</sub> MA	0.0041***	0.0799	-0,4116	Case3
GDD T <sub>base</sub> = 7 F	0.2629	0.0818	-0,4094	Case3
GDD T <sub>base</sub> = 8 DOY1-SOS	0.7796	0.0934	-0,3959	Case3
GDD T <sub>base</sub> = 7 DOY1-SOS	0.9442	0.0936	-0,3957	Case3
GDD T <sub>base</sub> = 6 DOY1-SOS	1	0.0959	-0,3931	Case3
GDD T <sub>base</sub> = 8 F	0.2939	0.1041	-0,3844	Case3
GDD T <sub>base</sub> = 5 DOY1-SOS	0.8887	0.1052	-0,3834	Case3
GDD T <sub>base</sub> = 3 JF	0.2079	0.106	-0,3826	Case3
GDD T <sub>base</sub> = 4 JF	0.2079	0.108	-0,3805	Case3
GDD T <sub>base</sub> = 2 JF	0.2079	0.1106	-0,378	Case3
T <sub>min</sub> A	0.1417	0.1171	-0,3717	Case3
GDD T <sub>base</sub> = 5 JF	0.2629	0.1185	-0,3704	Case3
GDD T <sub>base</sub> = 1 JF	0.2079	0.122	-0,3672	Case3
GDD T <sub>base</sub> = 4 DOY1-SOS	1	0.1232	-0,366	Case3
T <sub>min</sub> MA	0.0252**	0.1312	-0,359	Case3
T <sub>max</sub> MA	0.0424**	0.1344	-0,3563	Case3
GDD T <sub>base</sub> = 6 JF	0.3273	0.135	-0,3557	Case3
GDD T <sub>base</sub> = 0 JF	0.1617	0.1359	-0,3549	Case3
T <sub>max</sub> M	0.1075	0.1426	-0,3494	Case3
CH T <sub>base</sub> = 7.2 JF	0.363	0.1565	0,3383	Case3
GDD T <sub>base</sub> = 3 DOY1-SOS	1	0.1586	-0,3368	Case3
GDD T <sub>base</sub> = 7 JF	0.5756	0.159	-0,3365	Case3
T <sub>max</sub> FMA	0.2939	0.1608	-0,3351	Case3
GDD T <sub>base</sub> = 8 JF	0.4415	0.1844	-0,3181	Case3
T <sub>max</sub> FM	0.7264	0.1926	-0,3126	Case3
GDD T <sub>base</sub> = 2 DOY1-SOS	0.7796	0.2183	-0,2961	Case3
T <sub>mean</sub> JFMA	0.1075	0.2592	-0,2724	Case3
GDD T <sub>base</sub> = 1 DOY1-SOS	0.5756	0.3101	-0,246	Case3
T <sub>mean</sub> FM	0.3273	0.3217	-0,2403	Case3
T <sub>max</sub> JFMA	0.1417	0.3258	-0,2383	Case3
CH T <sub>base</sub> = 7.2 DJF	0.0589	0.383	0,2122	Case3
T <sub>max</sub> JFM	0.4415	0.3886	-0,2098	Case3
T <sub>max</sub> A	0.0689	0.4133	-0,1993	Case3

GDD T <sub>base</sub> = 0 DOY1-SOS	0.5756	0.4315	-0,1918	Case3
T <sub>mean</sub> M	0.1837	0.4483	-0,185	Case3
T <sub>mean</sub> F	0.6746	0.4661	-0,1779	Case3
T <sub>min</sub> M	0.0931	0.4797	-0,1727	Case3
T <sub>min</sub> JF	0.5289	0.5148	0,1593	Case3
T <sub>min</sub> F	0.5756	0.5617	0,1421	Case3
GDD T <sub>base</sub> = 2 J	0.8887	0.6518	-0,1107	Case3
T <sub>min</sub> FMA	0.8887	0.6543	-0,1099	Case3
GDD T <sub>base</sub> = 1 J	0.7264	0.6644	-0,1065	Case3
T <sub>min</sub> J	0.7796	0.6665	0,1058	Case3
GDD T <sub>base</sub> = 3 J	0.7796	0.669	-0,1049	Case3
T <sub>mean</sub> JFM	0.363	0.6694	-0,1048	Case3
CH T <sub>base</sub> = 7.2 D	0.363	0.6701	-0,1046	Case3
GDD T <sub>base</sub> = 0 J	0.6746	0.6786	-0,1017	Case3
CH T <sub>base</sub> = 7.2 J	0.6243	0.6881	0,0986	Case3
T <sub>mean</sub> J	0.8887	0.6954	0,0961	Case3
GDD T <sub>base</sub> = 4 J	0.8887	0.7061	-0,0926	Case3
T <sub>min</sub> JFM	0.8887	0.7153	0,0896	Case3
GDD T <sub>base</sub> = 5 J	1	0.748	-0,0789	Case3
GDD T <sub>base</sub> = 6 J	0.8887	0.7777	-0,0694	Case3
T <sub>max</sub> JF	0.9442	0.7948	-0,064	Case3
T <sub>max</sub> J	0.8337	0.8062	-0,0603	Case3
GDD T <sub>base</sub> = 7 J	1	0.8174	-0,0568	Case3
T <sub>max</sub> F	0.8887	0.8461	-0,0477	Case3
GDD T <sub>base</sub> = 8 J	0.9442	0.8628	-0,0425	Case3
CH T <sub>base</sub> = 7.2 DJ	0.3273	0.8903	-0,0339	Case3
T <sub>min</sub> FM	0.6243	0.8917	0,0335	Case3
T <sub>mean</sub> JF	0.6746	0.9088	-0,0282	Case3
T <sub>min</sub> JFMA	0.7264	0.9959	0,0012	Case3

Case 1: Variable has a significant trend over the study period and significant correlation with mean SOS trend.

Case 2: Variable does not have a significant trend over the study period but has significant correlation with mean SOS trend.

Case 3: Variable has a significant trend over the study period but does not have a significant correlation with mean SOS trend.