

**Table S1.** Climate conditions in the research fields. Source: AQUASTAT [97].

Location	Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
<b>Average monthly temperature, °C</b>													
CZ	2021	-2.6	-1.6	2.3	3.5	9.4	17.3	17.2	15.1	13.8	7.4	2.8	-0.5
	2022	-0.4	1.4	2.2	5.1	12.9	17.3	17.7	18.6	11.8	11.0	3.8	-0.7
	2023	0.7	-0.2	3.0	5.1	11.0	16.4	18.4	17.8	16.4	10.8	3.1	1.0
KZ	2017	-5.3	-3.4	2.9	10.4	18.1	22.0	26.3	22.6	18.9	11.2	3.8	-2.7
	2018	-10.4	-3.6	7.4	11.4	15.8	21.9	25.3	24.4	17.5	10.7	-1.2	-3.5
	2019	-2.4	02.4	6.8	12.6	15.7	21.7	27.2	24.7	19.0	11.5	0.3	-2.1
UA	2018	-0.3	-5.3	-1.6	12.5	15.3	17.5	18.3	19.4	14.3	10.4	4.2	-1.0
	2019	-5.0	1.0	4.4	8.5	12.2	19.4	17.7	19.2	14.5	11.2	7.1	2.0
	2020	-0.6	0.8	2.9	6.9	10.4	17.1	17.9	19.0	15.7	11.3	4.5	0.9
<b>Rainfall, mm</b>													
CZ	2021	112	69	61	63	149	93	140	197	51	37	68	71
	2022	108	89	29	69	73	88	61	95	148	37	46	58
	2023	66	75	107	69	34	88	101	134	33	101	111	133
KZ	2017	26	43	54	136	83	72	22	37	30	21	56	28
	2018	22	37	107	96	114	56	18	56	46	49	47	20
	2019	31	34	40	168	64	58	14	42	71	63	50	40
UA	2018	42	89	75	48	100	201	217	77	73	50	59	93
	2019	81	42	55	82	244	129	151	73	55	49	43	88
	2020	35	110	82	26	180	276	165	46	83	124	46	41
<b>Solar radiation, MJ m<sup>-2</sup> day<sup>-1</sup></b>													
CZ	2021	3.2	6.5	11.2	15.1	18.2	20.6	18.0	14.7	11.4	8.1	3.2	2.2
	2022	3.0	6.3	12.3	14.7	20.0	21.5	20.1	16.0	11.2	7.6	3.9	2.4
	2023	2.8	5.9	9.6	13.1	21.3	21.5	20.0	15.5	14.4	7.2	3.6	2.3
KZ	2017	6.9	10.7	14.4	17.5	22.5	23.1	24.6	22.3	17.6	11.9	7.5	5.8
	2018	7.5	10.0	13.3	18.6	22.8	22.6	25.0	20.6	16.9	11.1	7.6	5.8
	2019	6.9	10.1	15.8	15.1	23.7	23.4	25.6	21.8	16.5	11.9	7.5	5.8
UA	2018	4.1	7.2	11.8	17.9	21.1	17.6	16.9	18.1	12.9	8.7	4.9	2.6
	2019	3.7	6.6	11.5	15.2	14.4	21.2	20.4	17.8	13.5	9.3	4.3	3.0
	2020	3.9	6.0	11.0	19.7	16.5	16.9	18.5	19.2	14.3	6.8	4.2	3.2