

Figure S1. Comparison of daily average ($T_{s-avg-5}$, a and b) and minimum ($T_{s-min-5}$, c and d) soil temperature at the depth of 5cm below ground in the maize growing seasons in 2020 (a and c) and 2021 (b and d) among all treatments. The bars in the figures show the $T_{s-avg-5}$ or $T_{s-min-5}$ differences between the three mulching treatments (W, B, and S are transparent film, black film, and straw mulching, respectively) and the CK.

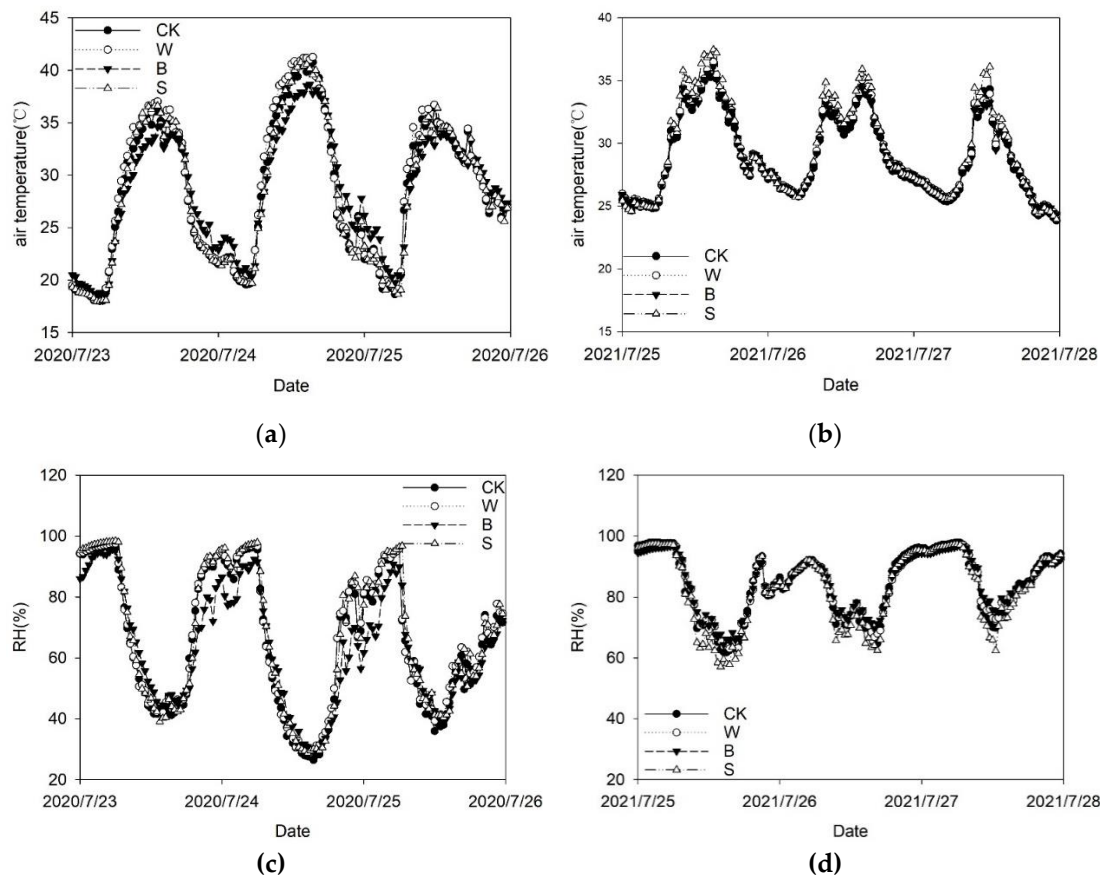


Figure S2. Changes in air temperature and humidity under different covering treatments in 2020 (a and b) and 2021(c and d).

Table S1. Total variance decomposition table.

Components	Initial eigenvalue			Extract the sum of squares of loads			Sum of squares of rotating loads		
	Total	Percentage variance	Accumulate %	Total	Percentage variance	Accumulate %	Total	Percentage variance	Accumulate %
1	4.175	69.58	69.58	4.18	69.58	69.58	4.17	69.57	69.57
2	1.301	21.69	91.27	1.30	21.69	91.27	1.30	21.70	91.27
3	0.380	6.34	97.61						
4	0.087	1.44	99.05						
5	0.046	0.77	99.82						
6	0.011	0.18	100						

Table S2. Principal component load matrix.

Factors	Principal component 1	Principal component 2
X1	-0.932	0.277
X2	-0.847	0.349
X3	0.938	0.204
X4		0.943
X5	0.985	
X6	0.857	0.415