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Soil Research

Supplementary Material

Sunlight can have a stronger influence than air temperature on soil solarisation: observational evidence from Australia

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Supplementary Materials

Table S1 Linear regression model for effects of UV index and air temperature (°C) on soil (at -6 cm) temperature (°C) for the 12-week soil solarisation treatment. The coefficients for UV, air temperature, and the interaction between UV index and air temperature are statistically significant, indicating that both sunlight and air temperature contribute to soil solarisation.

<i>Dependent variable:</i>	
Soil temperature (°C)	
UV index	8.290*** (1.259)
Air temperature (°C)	0.988*** (0.165)
UV index: Air temperature interaction	-0.197*** (0.048)
Constant	-3.494 (3.500)
Observations	105
R ²	0.771
Adjusted R ²	0.765
Residual Std. Error	3.546 (df = 101)
F Statistic	113.588*** (df = 3; 101)

Note: * p < 0.05 ** p < 0.01 *** p < 0.001

Table S2 Detailed classification information of soil at the study site: Self Mulching Black

Vertosol, Australian Soil Classification Code: VE AE EI. All codes reference Australian Soil Classification system.

Horizon		A1	B21	B22	B23k
Boundary		clear	diffuse	diffuse	diffuse
Depth (cm)		0-10	10-50	50-90	90-100
Colour		black (10 YR 2/1)	black (10 YR 2/1)	black (10 YR 2/1)	black (10 YR 2/1)
Mottles		-	-	-	few, 2-6mm, orange
Texture		Light Medium Clay	Medium Heavy Clay	Medium Heavy Clay	Medium Heavy Clay
Structure	Grade	Moderate	Strong	Strong	Strong
	Shape	Angular Blocky	Prismatic	Lenticular	Lenticular
	Size	3	5	3	2
Coarse Fragments		-	-	-	-
Segregations		-	-	-	20-50%, calcareous, soft, medium

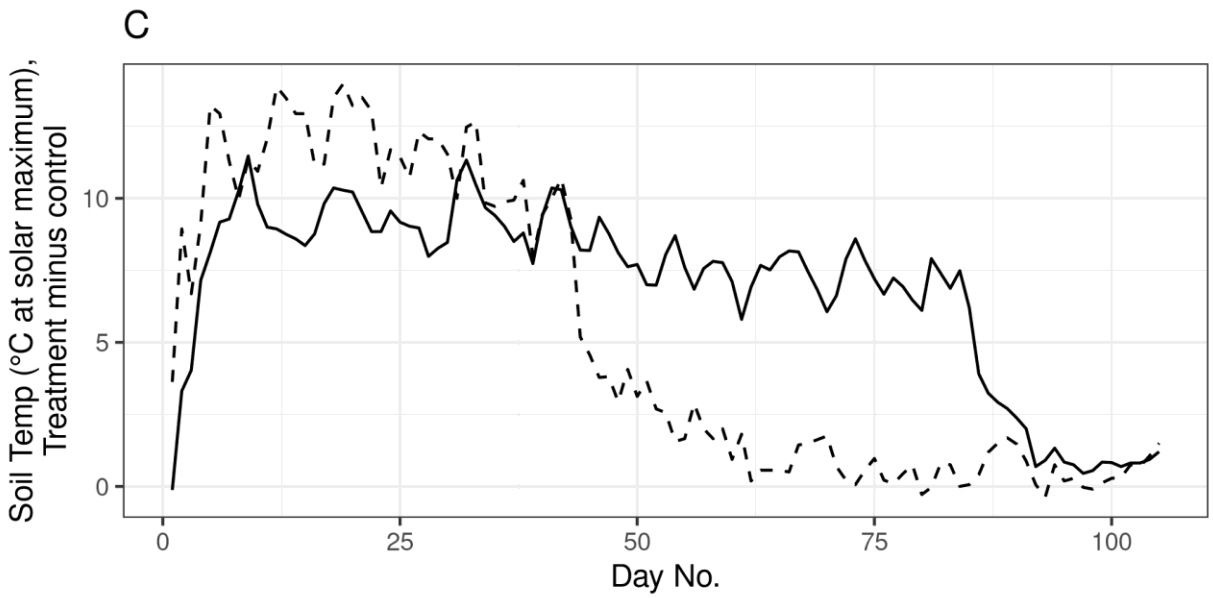
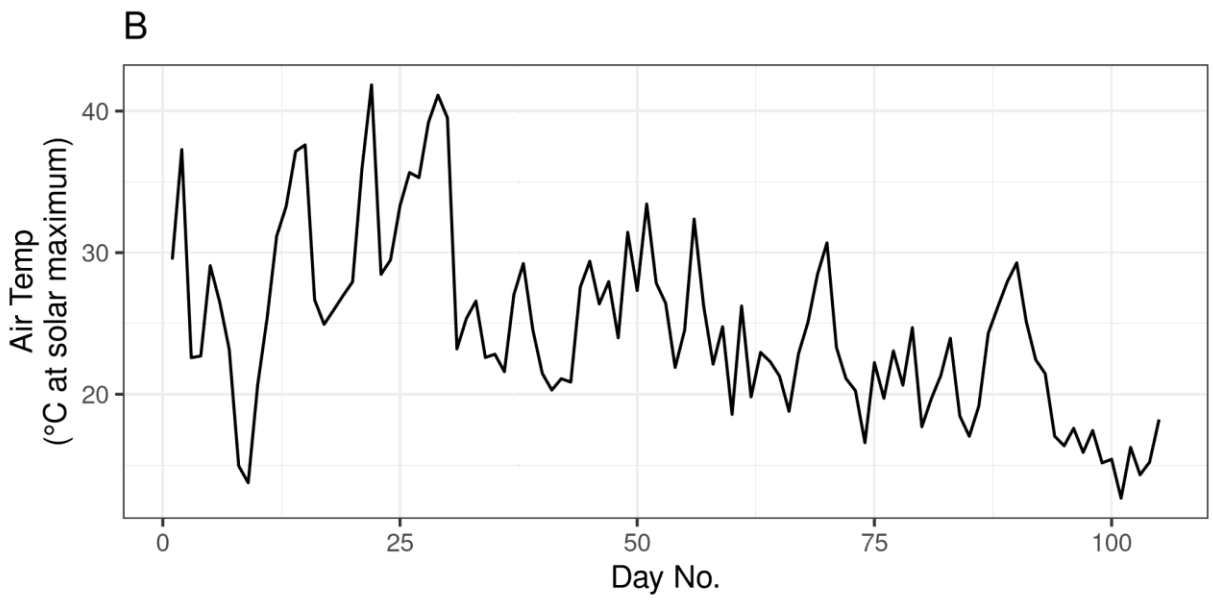
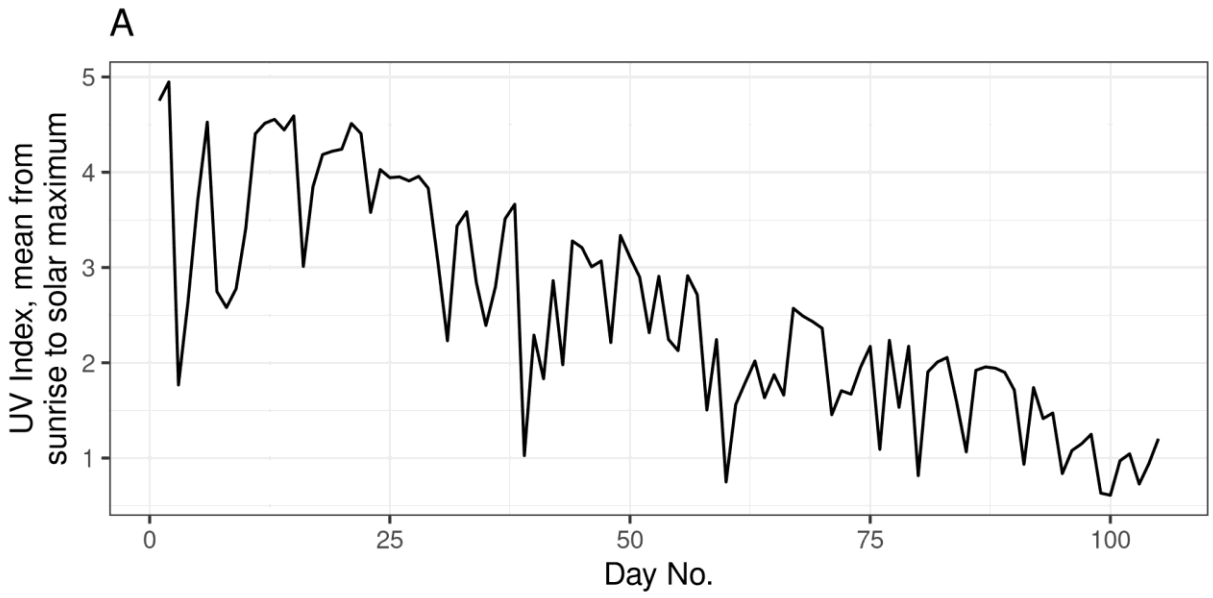


Fig. S1. Time series of ambient temperature and sunlight and soil temperature difference over study duration. (A) Time series showing the daily UV index mean calculated from sunrise to the time of peak daily sunlight, source: ARPANSA (2023); (B) Time series showing the daily air temperature ° C at the time of peak daily sunlight, averaged across the sensors in the 12 week treatment; (C) Time series showing the difference in daily soil daily topsoil (at -6 cm) temperature ° C for the 12 week and 6 week solarisation treatment at the time of peak daily sunlight, averaged across the sensors within each treatment (dashed lines indicate the 6 week solarisation treatment, while the solid line indicated the 12 week solarisation treatment).