SUPPLEMENTARY DATA

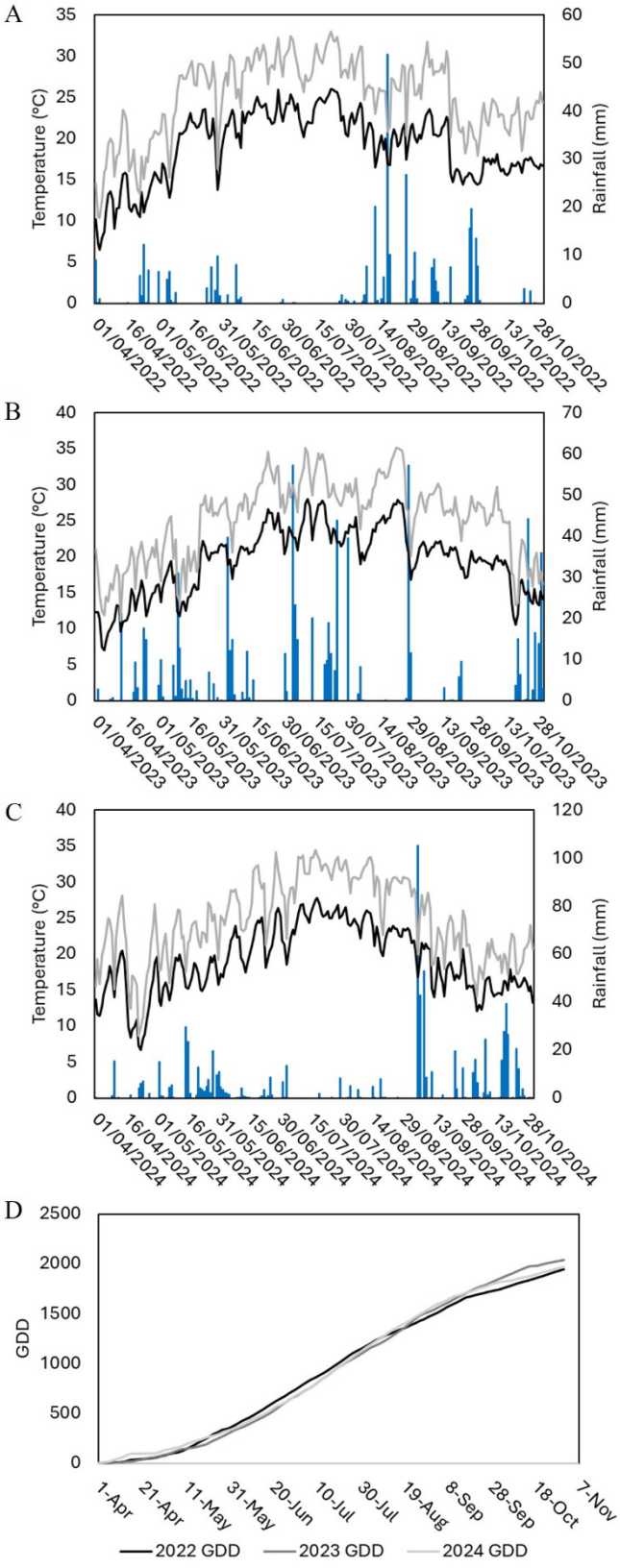
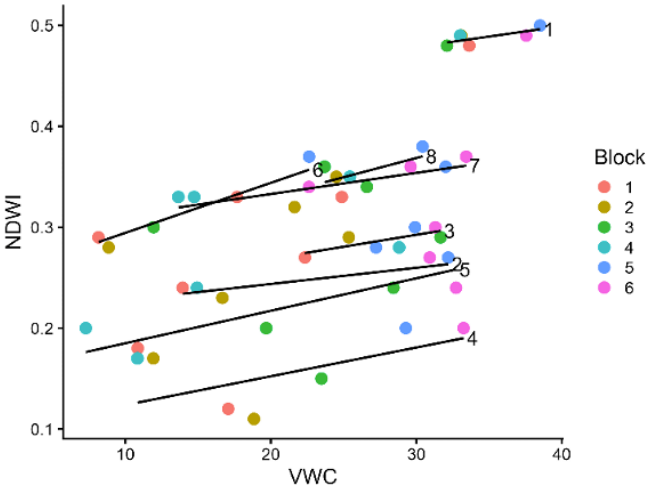


Figure S1. Climatic characterization during the experimental years (2022, 2023, and 2024). Daily average temperature (black line), daily maximum temperature (gray line), and daily rainfall amounts (blue bars) amount on 2022 (A), 2023 (B), and 2024 (C). Growing degree days (GDD) accumulated from April 01 to October 31 of each experimental year (D).



Figure S2. Application of the handheld GreenSeeker® sensor on the Pergola trellis system.



Line ID	NDWI	VWC
1	06/06/2023	06/06/2023
2	11/07/2024	11/07/2024
3	26/05/2023	23/05/2023
4	25/08/2025	24/08/2024
5	26/07/2024	26/07/2024
6	25/06/2023	27/06/2023
7	30/04/2024	30/04/2024
8	31/05/2023	31/05/2023

Figure S3. Relationship between normalized difference water index (NDWI) and volumetric water content (VWC). NDWI plotted against VWC across all sampling dates (n = 8). Each point represents a block-level observation (n = 6 per date), and lines indicate date-specific trend lines connecting block values; dates are identified by numbers shown beside the lines and listed in the table.

Table S1. List of the VIs used in this study.

Index	Acronym	Sensor	Equation	Reference
Modified soil adjusted vegetation index	MSAVI	UAV	$\frac{2 \cdot NIR + 1 - \sqrt{(2 \cdot NIR + 1)^2 - 8 \cdot (NIR - Red)}}{2}$	(Qi *et al.*, 1994)
Modified chlorophyll absorption ratio index	MCARI	UAV	$(Red\ Edge - Red) - 0.2 \cdot (Red - Green) \cdot (Red\ Edge / Red)$	(Daughtry *et al.*, 2000)
Normalized difference vegetation index	NDVI	UAV/Sentinel-2	$\frac{NIR - Red}{NIR + Red}$	(Rouse Jr *et al.*, 1974)
Normalized difference water index	NDWI	Sentinel-2	$\frac{NIR - SWIR}{NIR + SWIR}$	(Farbo *et al.*, 2024)

Table S2. Linear mixed-effects model results for the relationship between normalized difference water index (NDWI) and volumetric water content (VWC).

Effect	Estimate	SE	*p*-value
Intercept	0.247	0.033	<0.001
VWC	0.00227	0.00052	<0.001
Component	Variance	SD	
Date	0.00749	0.0865	
Block	0.00011	0.0105	
Residual	0.00022	0.0149	