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Spatially contrasting CO_2 dynamics driven by green manure intercropping in subtropical tea plantations

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Flux calculation:

The CO_2 flux was calculated using the following equation:

$$F = \rho_0 \times \frac{P}{P_O} \times \frac{T_O}{T+T_O} \times \frac{V}{M} \times \frac{\Delta c}{\Delta t} \quad \text{(S1)}$$

where F is the CO_2 flux ($mg \cdot m^{-2} \cdot min^{-1}$); ρ_0 is the density of CO_2 under standard conditions (1.98 $kg \cdot m^{-3}$); P_O and T_O are the standard atmospheric pressure (101.325 kPa) and temperature (273.15 K), respectively; P and T are the atmospheric pressure (kPa) and absolute temperature (K) at the time of sampling; V and M are the volume (m^3) and bottom area (m^2) of the chamber, respectively; $\triangle c/\triangle t$ is the slope of the linear or nonlinear regression of CO_2 concentration over time.

First, the raw CO_2 concentration readings were calibrated with standard gases. Then, linear regression was performed to fit their rate of change over time. Finally, CO_2 flux was calculated using the standard flux formula by incorporating the chamber volume, base area, and the measured atmospheric pressure and temperature. Based on the daily mean flux values, we further divided the data according to the green manure growth stages and seasons, calculating the mean flux values for each stage and season. The calculation of the annual cumulative CO_2 flux was estimated based on linear interpolation between adjacent sampling days.

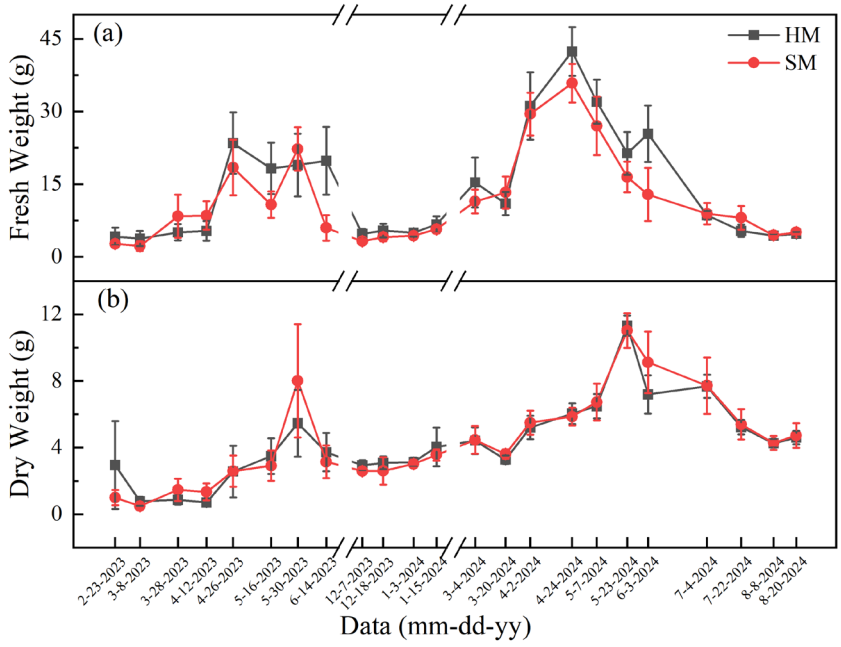

Figure S1. Temporal trend of green manure indexes.