

Supplementary Materials

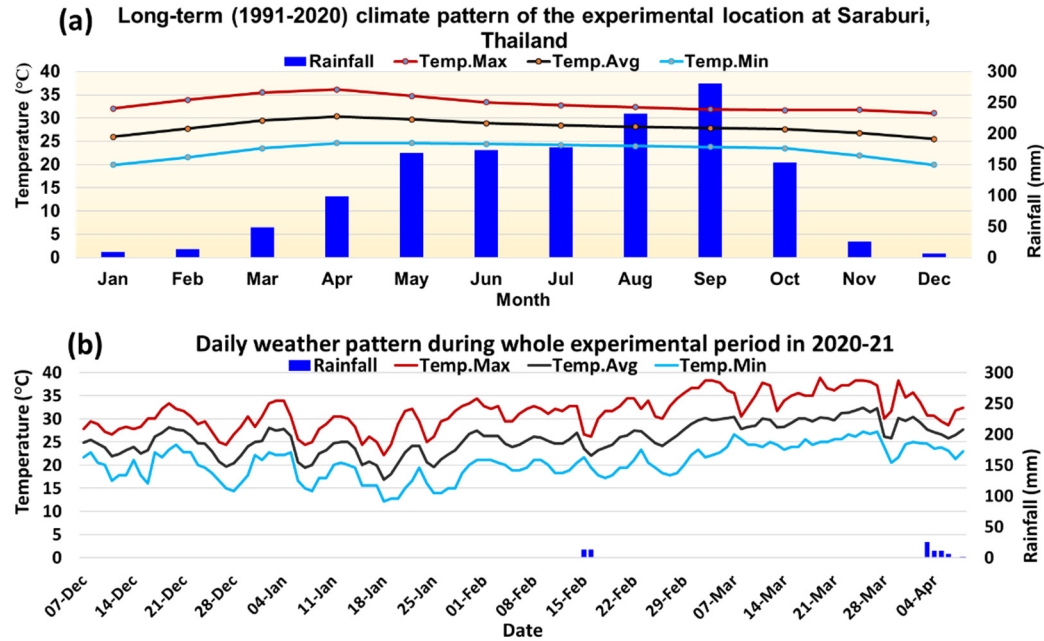


Figure S1. (a) Monthly climatology during 1991–2020 at the experimental location, Saraburi, and (b) daily weather collected by installing a mini weather station in the experimental plot during the whole crop period in 2020–2021 at Saraburi, Thailand. Temp.: (temperature °C, maximum, average & minimum) and rainfall (mm). [130].

Table S1. Energy equivalents of inputs and outputs in maize production systems.

Equipment/inputs	Unit	Energy equivalent coefficient (MJ/Unit)	Reference
A. Inputs			
1. Human labor	H	1.96	[71,131,124]
2. Machinery	H	64.8	[71,132]
3. Nitrogen (N)	kg	66.14	[71,131,133]
4. Phosphorus (P)	kg	12.44	[71,131,133]
5. Potassium (K)	kg	11.15	[71,133]
6. Pesticides	kg	120	[71,124]
7. Plant growth regulator (PGR)	kg	85	[134]
8. Diesel	L	56.31	[71,135]
9. Electricity	kWh	3.6	[71,136]
10. Irrigation water	m ³	0.63	[71,131,136]
11. Seed of maize	kg	14.7	[71,124]
B. Output			
1. Maize	kg	14.7	[131]

Table S2. Emission coefficient of different inputs used in maize production systems.

Inputs	Unit	Emission factor (kg CO ₂ -eq per unit)	Reference
1. Nitrogen (N)	kg	8.30	[71,137]
2. Phosphorus (P ₂ O ₅)	kg	0.61	[71,138]
3. Potassium (K ₂ O)	kg	0.44	[71,138]
4. Pesticides & PGR	kg	18.00	[71,138]
5. Diesel	L	2.63	[71,129]
6. Electricity	kWh	0.80	[71,139]
7. Seed	kg	3.85	[71,138]