

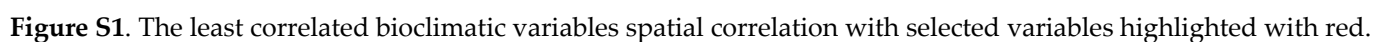
Supplementary

Table S1. Description of LULC classes of the study

Land Cover	Description
Barren	Lands with exposed soil, sand, or rocks and never has more than 10% vegetated cover during any time of the year.
Built up	Land covered by buildings and other manmade structures.
Cropland	Lands covered with temporary crops followed by harvest and a bare soil period (e.g., Single and multiple cropping systems).
Forest	Refer to land with a tree canopy cover of more than 10 percent.
Grassland	Dominated by herbaceous annuals (<2m).
Savanna	Tree cover 10-30% (canopy >2m).
Shrubs	Woody perennial plants with persistent and woody stems and without any defined main stem being less than 5 metre tall. The shrub foliage can be either evergreen or deciduous.
Water	At least 60% of area is covered by permanent water bodies.
Wetlands	Permanently inundated lands with 30-60% water cover and >10% vegetated cover.

Table S2. Landcover statistics

Classes	Area (km2)	Proportion %
Forest	5735.1	2.02
Shrubs	5523.46	1.94
Savanna	14387.02	5.06
Grassland	143013.82	50.28
Wetlands	973.18	0.34
Cropland	106978.82	37.61
Built up	404.5	0.14
Barren	144.47	0.05
Water	7300.7	2.57
Total	284461.06	100



Reference										
Cat	Forest	Shrubs	Savanna	Grassland	Wetlands	Cropland	Built	Barren	Water	Row
							up			Sum
Forest	28958	0	509	0	0	51	0	0	0	29518
Shrubs	0	4940	0	8714	0	176	0	0	0	13830
Savanna	215	0	18764	456	0	133	0	0	0	19568
Grassland	0	0	2056	20033	0	34	0	0	0	22123
Wetlands	0	0	550	0	1130	42	0	0	0	1722
Cropland	0	0	0	0	0	81562	0	0	0	81562
Built up	0	0	0	0	0	85	2411	0	0	2496
Barren	0	0	0	524	227	0	0	885	0	1636
Water	0	0	0	0	277	0	0	0	71767	72044
Col Sum	29173	4940	21879	29727	1634	82083	2411	885	71767	244499
Kappa				0.92						
Overall				94.25						
Accuracy										

Table S4. Selected non-colinear variables used to predict the habitat suitability for *Tuta absoluta* using the MaxEnt model.

Selected variable	description	Unit
Bio1	Annual Mean Temperature	°C
Bio4	Temperature Seasonality (standard deviation ×100)	°C
Bio7	Temperature Annual Range (BIO5-BIO6)	°C
Bio12	Annual Precipitation	mm
Bio14	Precipitation of Driest Month	mm
LULC	Land use land cover	Categorical

Table S5. Temperature-based performance of the parasitoid *Dolichogenidea gelechiidivoris*.

Temperature (°C)	Net reproductive rate (R_0)
10	0.13
15	1.55
20	14.99
25	14.25
30	2.18
35	0.06

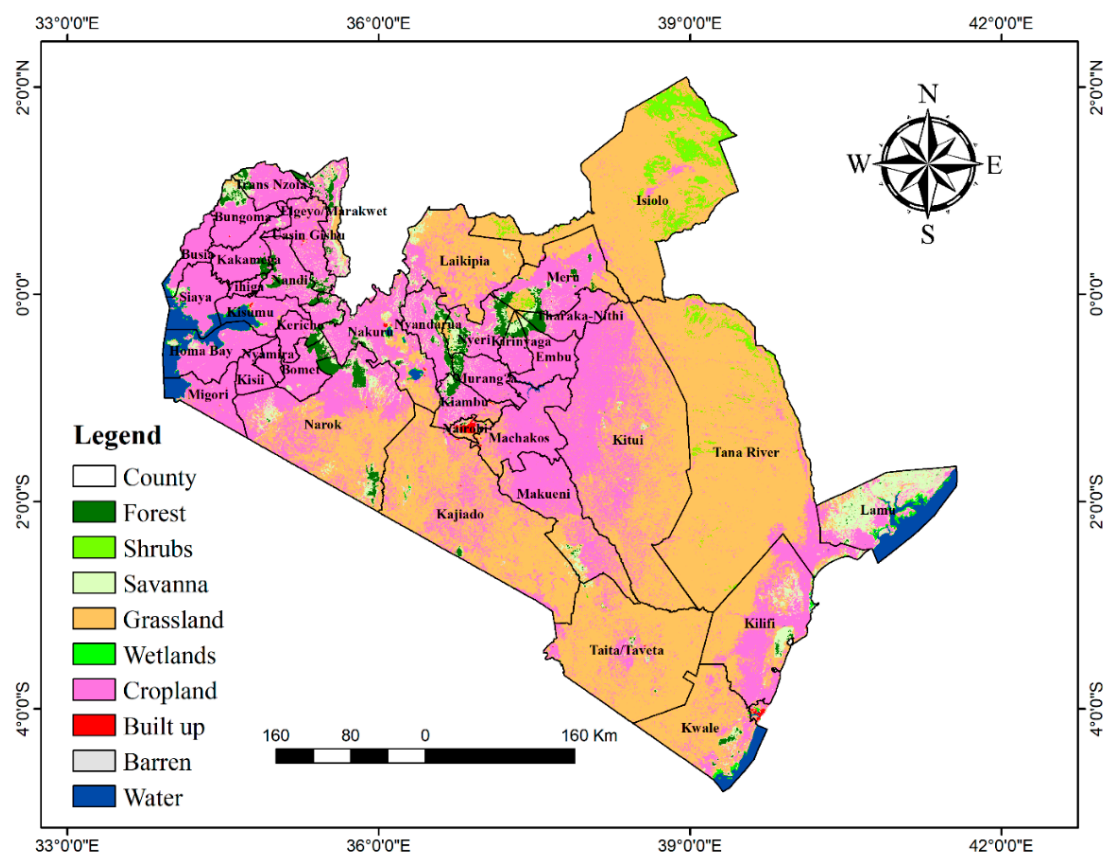


Figure S2. Classified LULC map for different years based on nine classes extracted from the study area with a proportionate coverage area.

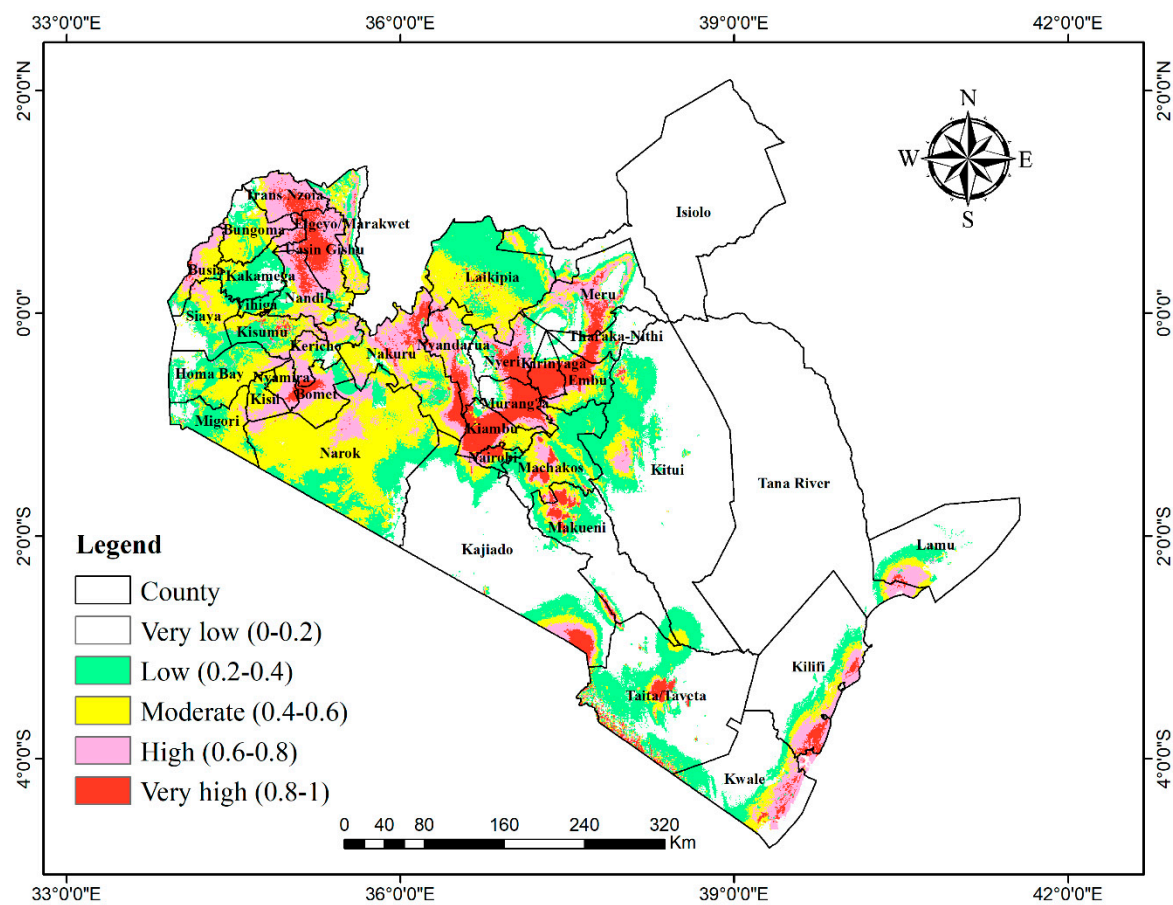


Figure S3. Map of suitability areas of *T. absoluta* for the classified LULC in the strategic tomato production areas.