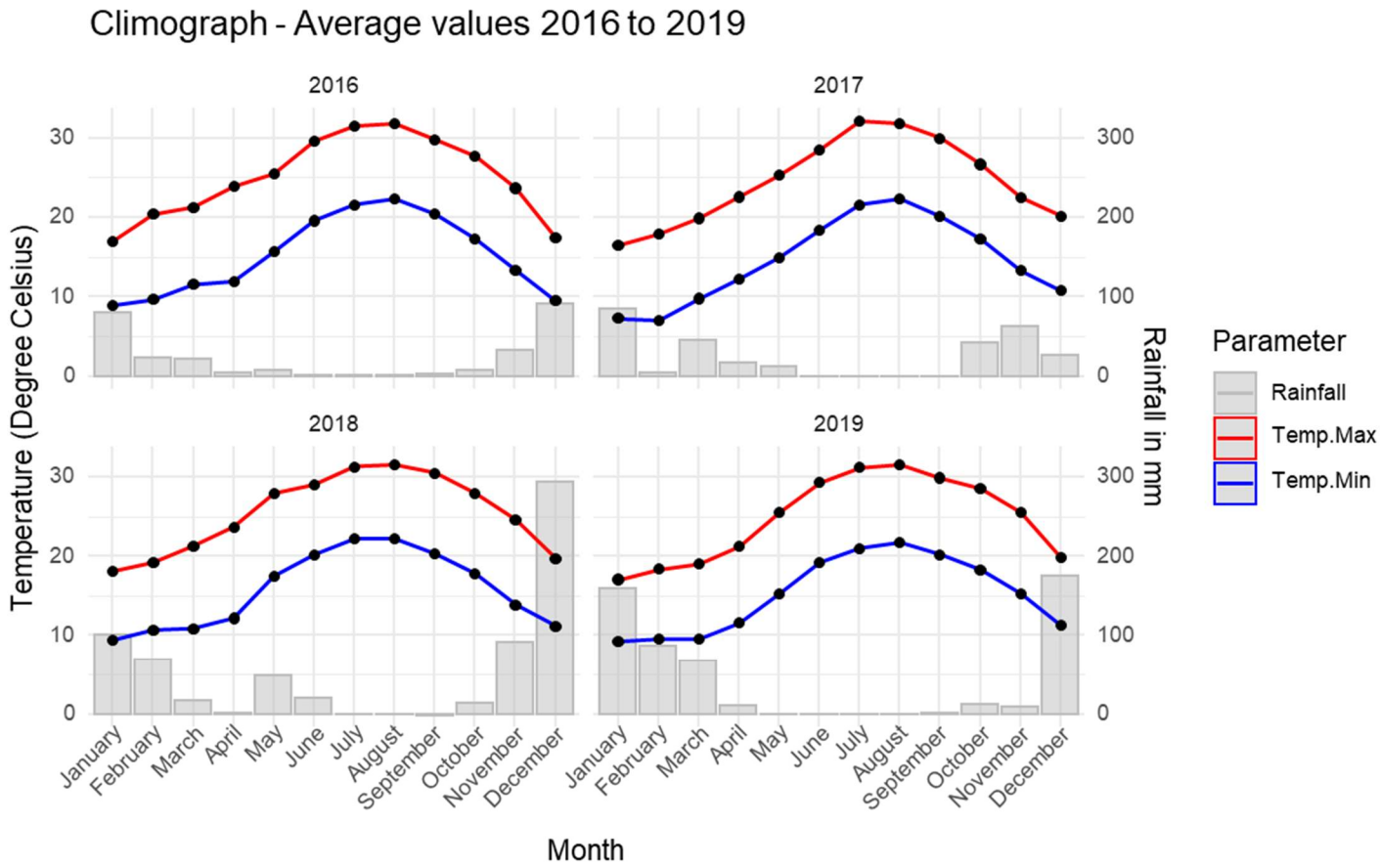
SUPPLEMENTARY DATA

Table 1: Concentration of soil total N, available K and P-Olsen at the beginning of each growing season and before the application of the treatments and seeding the crop. The source of variance was calculated with two-way ANOVA. Different letters denote statistically significant differences between the mean concentration within each growing season based on TukeyHSD at $p<0.05$

Growing season	Nitrogen management	Total N (mg/g)	K (ppm)	P-Olsen (ppm)
2016-2017	Control	0.91±0.12 a	200.1±11.8 a	25.5±4.9 a
	Compost	1.12±0.14 a	215.4±12.3 a	27.3±3.8 a
	NH_4NO_3	0.98 ±0.11 a	210.5±15.4 a	25.6±5.4 a
	Manure	0.92±0.09 a	221.8±9.6 a	26.4±3.3 a
2017-2018	Control	0.89±0.09 a	210.3±12.7 a	20.7±5.4 a
	Compost	0.98±0.11 a	205.6±22.7 a	34.2±7.8 a
	NH_4NO_3	0.93±0.09 a	199.1±38.5 a	22.6±4.6 a
	Manure	1.21±0.12 a	208.4±23.7 a	31.3±6.9 a
2017-2018	Control	0.92±0.09 a	214.6±23.7 a	19.5±5.3 a
	Compost	1.42±0.11 a	235.7±35.1 a	29.4±4.8 a
	NH_4NO_3	1.12±0.13 a	220.9±18.3 a	24.2±3.6 a
	Manure	1.26±0.14 a	245.6±26.4 a	27.9±2.8 a
		Source of Variance		
Growing season		ns	ns	ns
N-management		ns	ns	ns
Interaction		ns	ns	ns


Climograph - Average values 2016 to 2019
2016
2017
2018
2019
Temperature (Degree Celsius)
Rainfall in mm
Month
Parameter
Rainfall
Temp.Max
Temp.Min
January
February
March
April
May
June
July
August
September
October
November
December
0
10
20
30
100
200
300

lavaan 0.6-12 ended normally after 89 iterations

Estimator	ML
Optimization method	NLMINB
Number of model parameters	24
Number of observations	108
Model Test User Model:	
Test statistic	61.352
Degrees of freedom	30
P-value (Chi-square)	0.001
Parameter Estimates:	
Standard errors	Standard
Information	Expected
Information saturated (h1) model	Structured

Latent Variables:

		Estimate	Std.Err	z-value	P(>|z|)	Std.lv	Std.all
Nitrogen =~							
TKN_GR	(l1)	1.000				0.995	1.000
TKN_HAY	(l2)	0.455	0.177	2.569	0.010	0.343	0.345
macro =~							
Ca	(l3)	1.000				0.146	0.177
Mg	(l4)	2.336	2.121	1.101	0.271	0.342	0.274
micro =~							
Cu	(l5)	1.000				0.432	0.443
Zn	(l6)	2.028	0.462	4.388	0.000	0.877	0.871
Mn	(l7)	1.245	0.335	3.720	0.000	0.538	0.541
Fe	(l8)	0.854	0.287	2.975	0.003	0.369	0.379
Prod =~							
Yield	(l9)	1.000				0.920	0.926
Straw	(l10)	1.058	0.109	9.689	0.000	0.973	0.980

Regressions:

		Estimate	Std.Err	z-value	P(>|z|)	Std.lv	Std.all
Nitrogen ~							
Nsrc	(a1)	0.470	0.085	5.532	0.000	0.472	0.470
macro ~							
Nsrc	(a2)	0.104	0.090	1.167	0.243	0.714	0.710
micro ~							
Nsrc	(a3)	0.363	0.083	4.366	0.000	0.840	0.836
Prod ~							
Nsrc	(a4)	0.032	1.392	0.023	0.981	0.035	0.035
micro	(a6)	-0.854	0.529	-1.613	0.107	-0.401	-0.401
macro	(a7)	3.485	13.023	0.268	0.789	0.555	0.555
Nitrogen	(a8)	0.298	0.096	3.095	0.002	0.322	0.322

Variances:

	Estimate	Std.Err	z-value	P(>|z|)	Std.lv	Std.all
.TKN_GR	0.000				0.000	0.000
.Ca	0.969	0.138	7.034	0.000	0.969	0.978
.Mg	0.874	0.248	3.522	0.000	0.874	0.882
.Cu	0.804	0.113	7.092	0.000	0.804	0.811
.Zn	0.222	0.078	2.831	0.005	0.222	0.224
.Mn	0.701	0.102	6.885	0.000	0.701	0.708
.Fe	0.854	0.119	7.173	0.000	0.854	0.862
.Yield	0.140	0.082	1.720	0.085	0.140	0.142
.Straw	0.038	0.089	0.427	0.669	0.038	0.039
.Nitrogen	0.772	0.105	7.348	0.000	0.779	0.779
.macro	0.011	0.041	0.261	0.794	0.495	0.495
.micro	0.056	0.028	1.992	0.046	0.301	0.301
.Prod	0.557	0.520	1.069	0.285	0.658	0.658

R-Square:

	Estimate
TKN_GR	1.000
Ca	0.022
Mg	0.118
Cu	0.189
Zn	0.776
Mn	0.292
Fe	0.138
Yield	0.858
Straw	0.961
Nitrogen	0.371
macro	0.792
micro	0.711
Prod	0.472

Defined Parameters:

	Estimate	Std.Err	z-value	P(>|z|)	Std.lv	Std.all
nitrogen_a1a8	0.140	0.052	2.701	0.007	0.152	0.152
macro_a2a7	0.364	1.378	0.264	0.792	0.396	0.394
micro_a3a6	-0.310	0.187	-1.656	0.098	-0.337	-0.336