

Supplementary Material

Table S1. Means of maximum and minimum temperatures and rainfall during the experiment period.

Climate characteristics	Month											
	May	June	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.
<u>First crop growing season</u>												
Maximum temp., °C	23.5	21.9	24.6	26.4	28.2	26.7	27.7	30.5	29.3	32.1	30.8	30.8
Minimum temp., °C	12.9	10.9	12.2	14.3	13.4	16.7	15.1	17.8	17.5	20.0	18.4	18.0
Rainfall, mm	16	49	7	24	0	359	102	143	357	165	59	62
<u>Second crop growing season</u>												
Maximum temp., °C	24.0	21.5	23.5	25.9	28.1	29.7	279	29.9	27.6	28.4	26.5	26.6
Minimum temp., °C	13.9	14.2	12.6	14.4	15.6	18.1	19.2	21.5	19.9	20.9	20.0	20.7
Rainfall, mm	78	228	22	0	51	159	104	419	292	161	267	77

Table S2. Statistical parameters by ANOVA test at $p \leq 0.05$ significance level of experimental factors (N rates \times lime application) for maize nutrition and agronomic parameters.

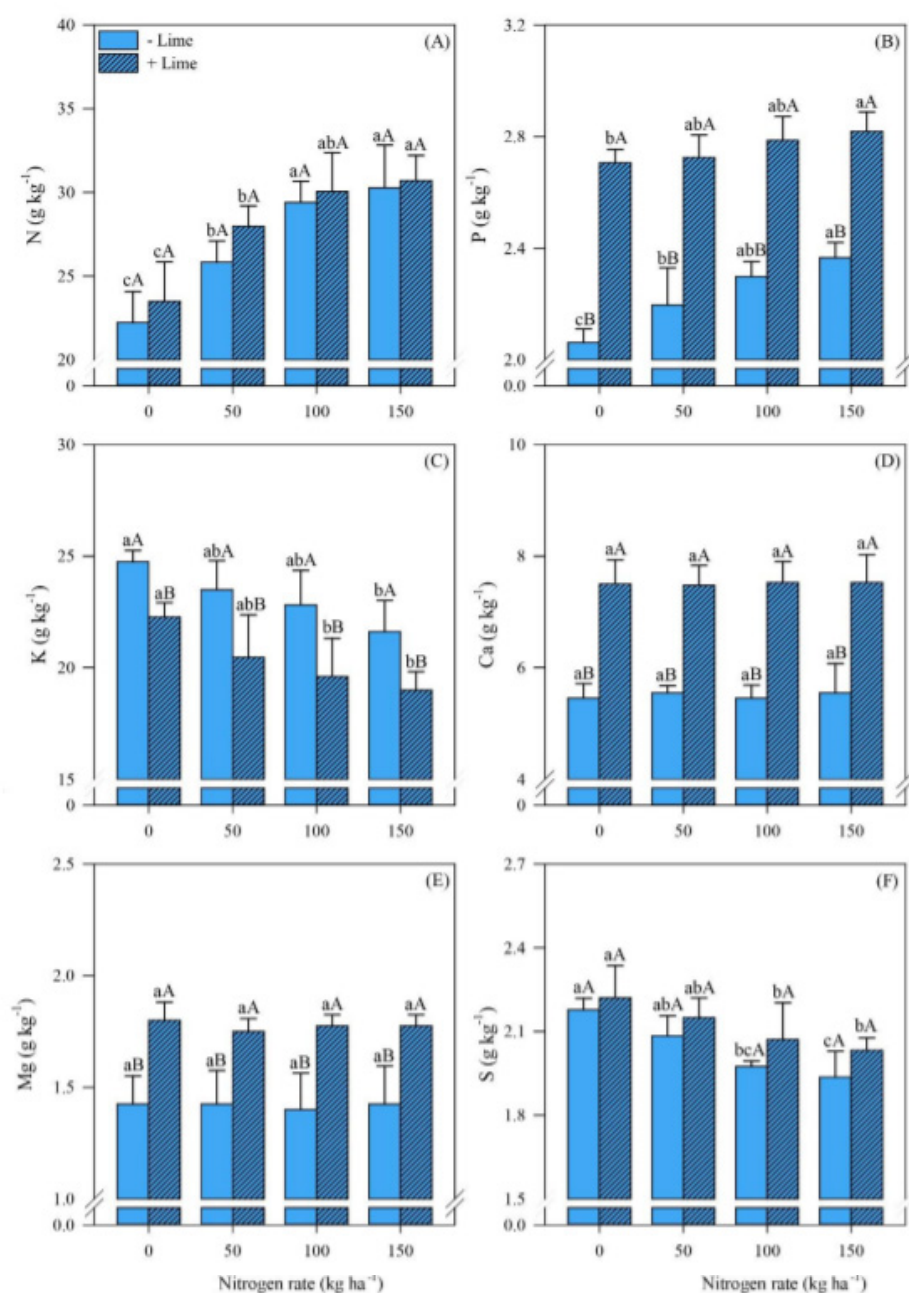
Treatments	N	P	K	Ca	Mg	S
<i>F probability</i>						
Nitrogen rates (N)	<0.001	<0.001	0.0011	0.9857	0.9713	<0.001
Lime (L)	0.0878	<0.001	<0.001	<0.001	<0.001	0.226
N × L	0.0073	0.0450	0.0426	0.9734	0.9713	0.0346
CV (%)	6.44	3.02	6.32	5.51	7.6	4.16
Treatments	Prolificacy		Grains ear ⁻¹	W100	Grain Yield	
<i>F probability</i>						
Nitrogen rates (N)	<0.001		<0.001	0.0220	<0.001	
Lime (L)	0.0016		<0.001	0.1333	<0.001	
N × L	0.0136		0.0049	0.8425	0.0318	
CV (%)	6.50		2.58	4.59	7.71	

N: Nitrogen (N). P: phosphorus. K: potassium. Ca: calcium. Mg: magnesium. S: sulfur. Prolificacy: number of ears per plant. W100: 100-grain weight.

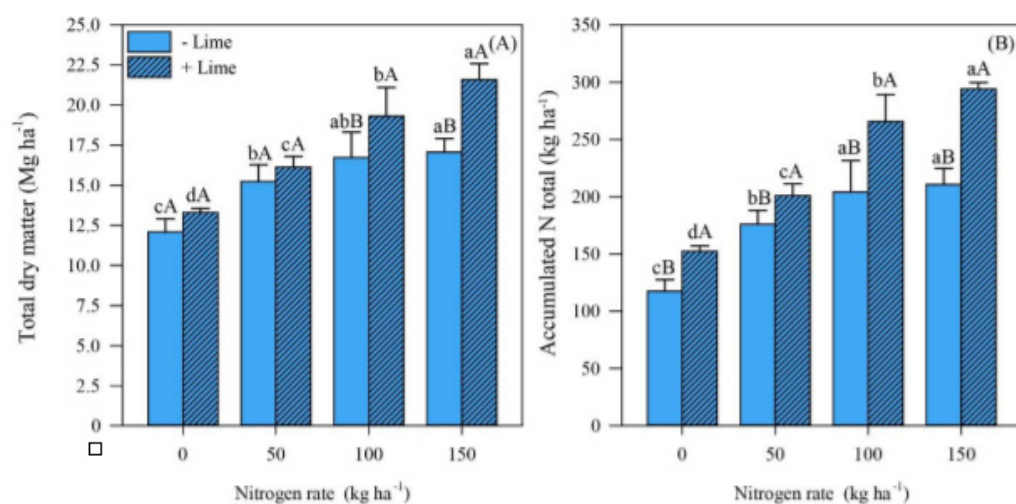
Table S3. Statistical parameters by ANOVA test at $p \leq 0.05$ significance level of experimental factors (N rates \times lime application) for upland rice nutrition and agronomic parameters.

Treatments	N	P	K	Ca	Mg	S
<i>F probability</i>						
Nitrogen rates (N)	<0.001	0.0345	0.3462	0.0599	0.2674	0.0014
Lime (L)	<0.001	<0.001	0.0118	<0.001	<0.001	0.9388
N × L	<0.001	0.0458	0.9054	0.0500	0.9898	0.1615
Treatments	Panicles m ⁻²	Spikelet panicle ⁻¹	Spikelet fertility	W1000G	Grain yield	
<i>F probability</i>						
Nitrogen rates (N)	<0.001	0.0018	<0.001	<0.001	<0.001	<0.001
Lime (L)	0.0085	0.0024	0.0317	0.0629	<0.001	
N × L	0.0385	0.0405	0.0416	0.9453	0.0555	

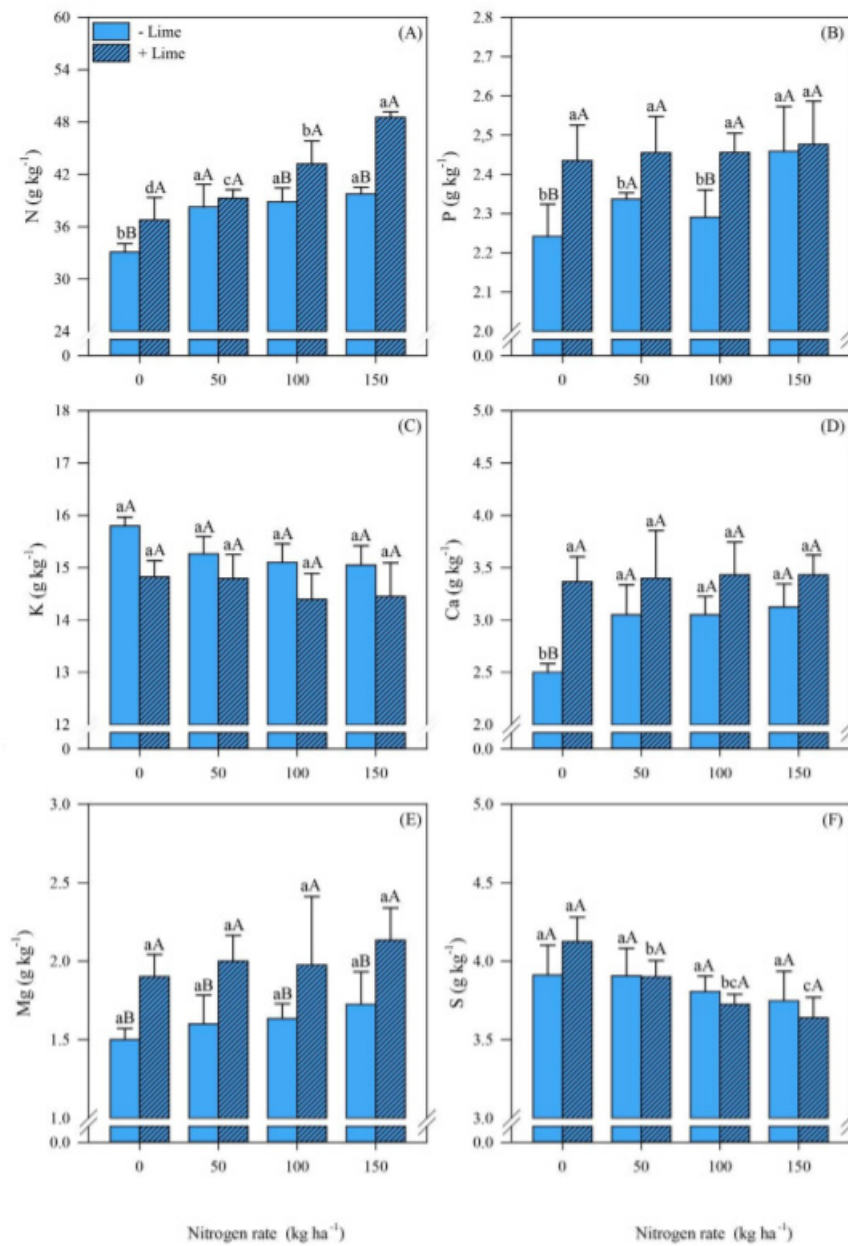
N: nitrogen. P: phosphorus. K: potassium. Ca: calcium. Mg: magnesium. S: sulfur. W1000: 1000-grain weight.



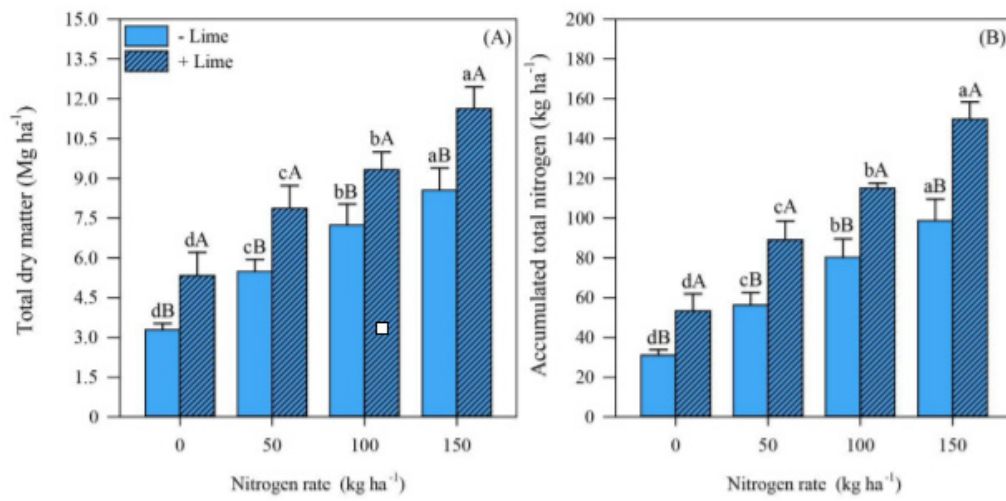
Supplementary Fig S1. Concentrations of nitrogen (A), phosphorus (B), potassium (C), calcium (D), magnesium (E) and sulfur (F) in diagnosis maize leaves under different treatments [0 (no N applied), 50, 100 and 150 kg N ha⁻¹ × absence (-Lime) and presence (+Lime) of lime application]. Different lowercase and uppercase letters indicate significant differences between N rates and lime applications, respectively, by Student's t-test at $p \leq 0.05$. The error bars express the standard error of the mean ($n = 4$).



Supplementary Fig S2. Total dry matter and total N accumulated of maize under different treatments [0 (no N applied), 50, 100 and 150 kg N ha⁻¹ × absence (-Lime) and presence (+Lime) of lime application]. Different lowercase and uppercase letters indicate significant differences between N rates and lime applications, respectively, by Student's t-test at $p \leq 0.05$. The error bars express the standard error of the mean ($n = 4$).



Supplementary Fig S3. Concentrations of nitrogen (A), phosphorus (B), potassium (C), calcium (D), magnesium (E) and sulfur (F) in diagnosis upland rice leaves under different treatments [0 (no N applied), 50, 100 and 150 kg N ha⁻¹ × absence (-Lime) and presence (+Lime) of lime application]. Different lowercase and uppercase letters indicate significant differences between N rates and lime applications, respectively, by Student's t-test at $p \leq 0.05$. The error bars express the standard error of the mean ($n = 4$).



Supplementary Fig S4. Total dry matter and total N accumulated of upland rice under different treatments [0 (no N applied), 50, 100 and 150 kg N ha⁻¹ × absence (-Lime) and presence (+Lime) of lime application]. Different lowercase and uppercase letters indicate significant differences between N rates and lime applications, respectively, by Student's t-test at $p \leq 0.05$. The error bars express the standard error of the mean ($n = 4$).