Supplementary Materials

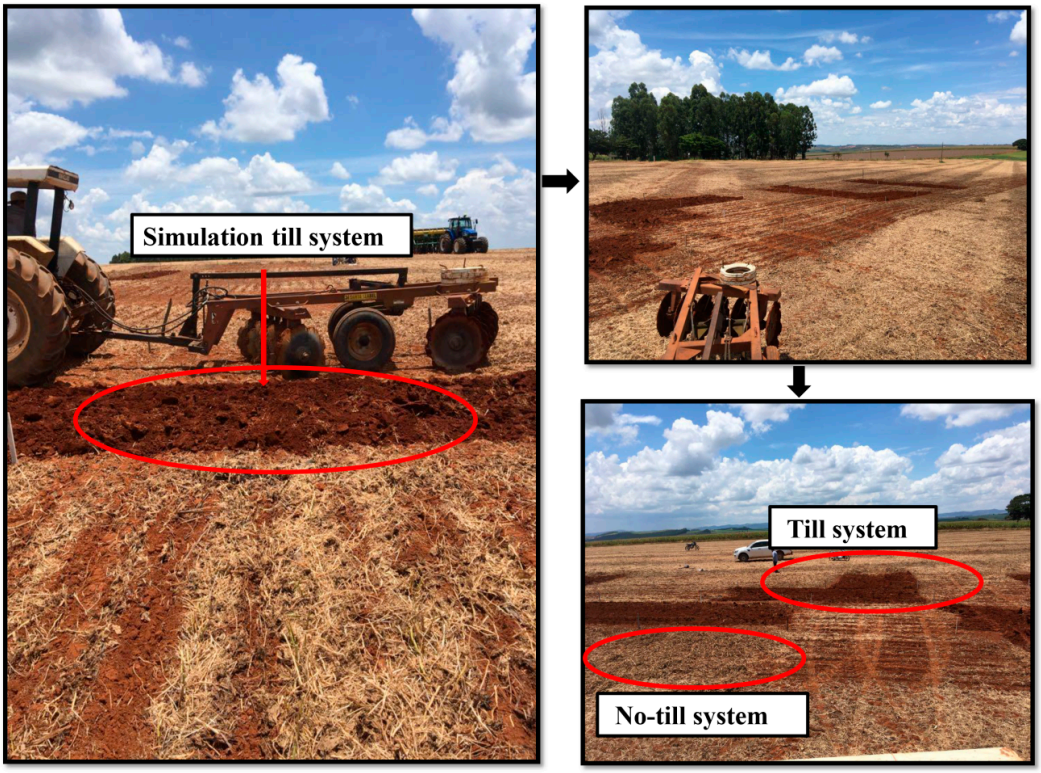

Figure S1. – Scheme of the simulation of conventional tillage within a no-till area before the sowing of soybean. The authors declare that they own this image.

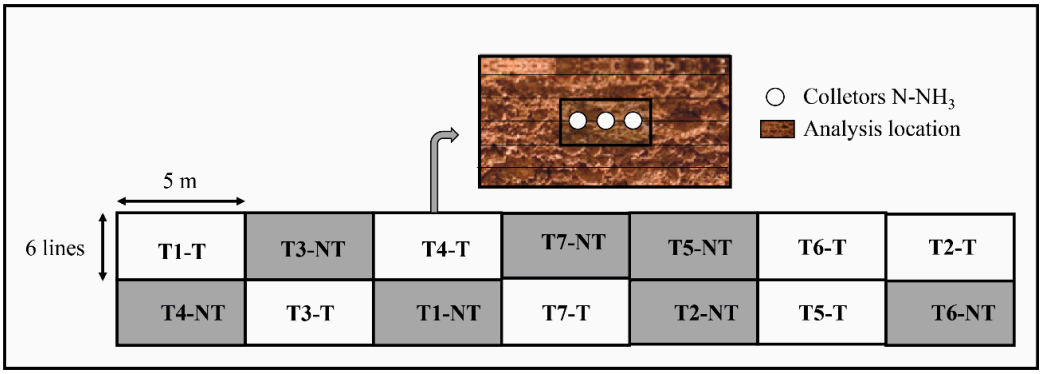

Figure S2. – Design of the distribution of treatments in field, referring to only one block of the experiment. NT: no-till system, T: conventional tillage system, T1: control, T2: PU, T3: U_{NBPT}, T4: U_{CuB}, T5: AN, and T6: AS.

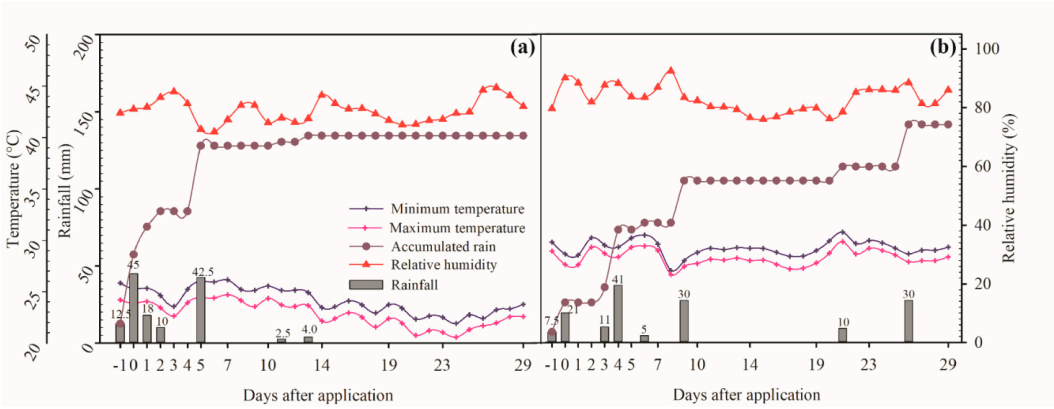

Figure S3. – Rainfall, maximum and minimum temperatures, and relative air humidity during the evaluation period of the losses of N-NH_3 by volatilization in the 2017/2018 (a) and 2018/2019 (b) crop seasons.

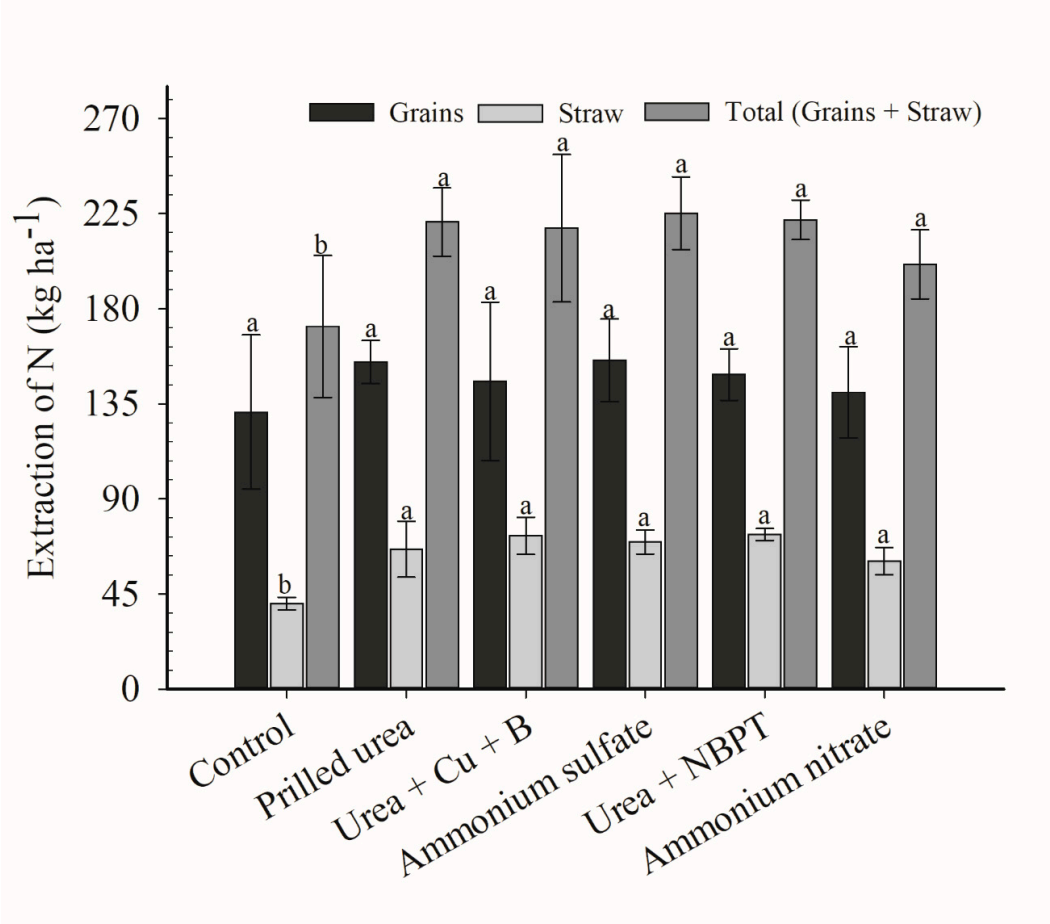

Figure S4. – Nitrogen extraction by the corn grains, shoot dry matter (straw), and total dry matter of corn that received N fertilization in the 2017/2018 crop season. *Treatments followed by the same letter do not differ at 5 % significance level by the Scott-Knott test. The vertical bars indicate the standard error of the mean (n=3).

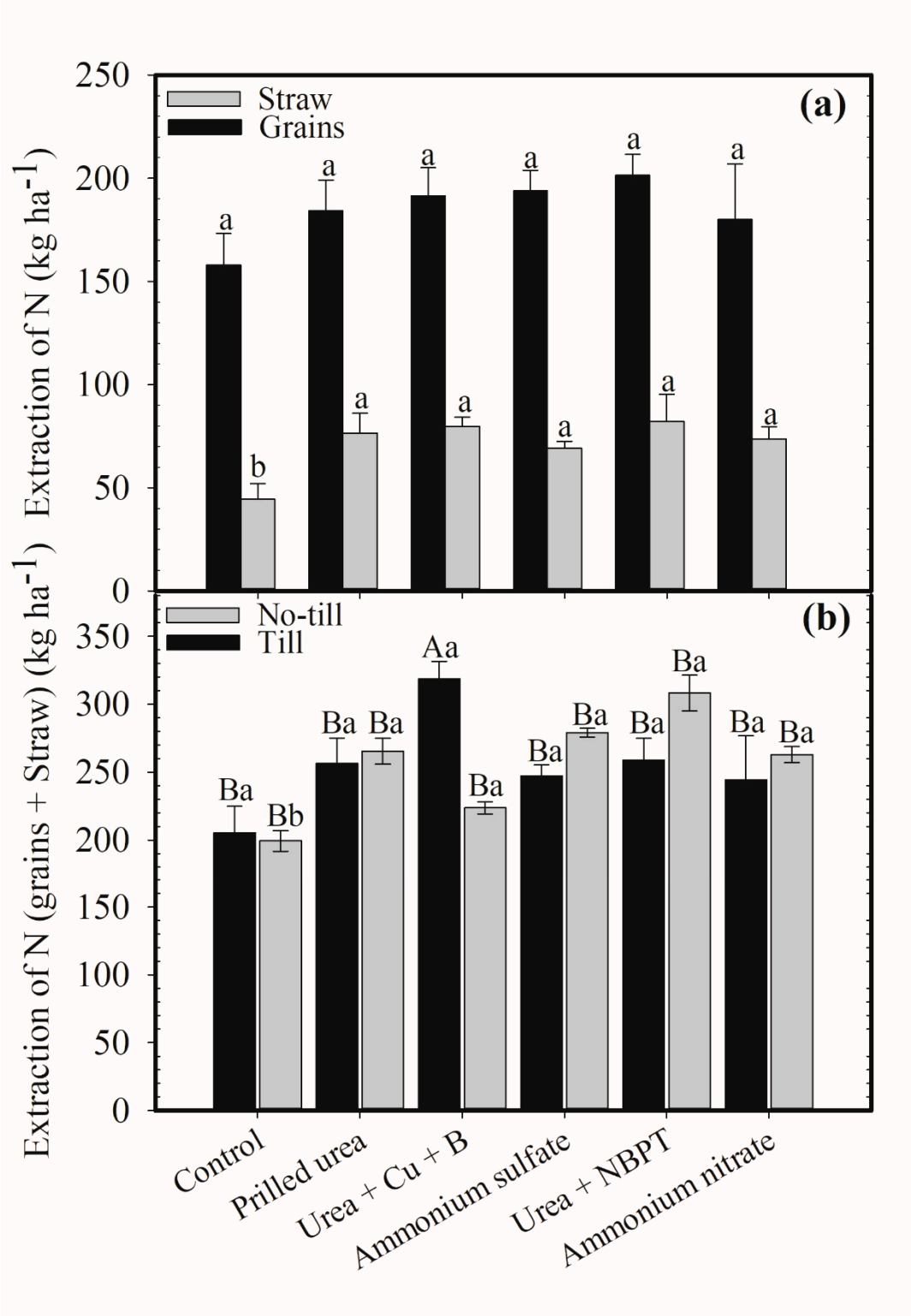

Figure S5. – Nitrogen extraction by the corn grains, shoot dry matter (straw) (a), and total dry matter of corn that received N fertilization (b) in the 2018/2019 crop season. *Treatments followed by the same letter do not differ at 5 % significance level by the Scott-Knott test. The vertical bars indicate the standard error of the mean (n=3).

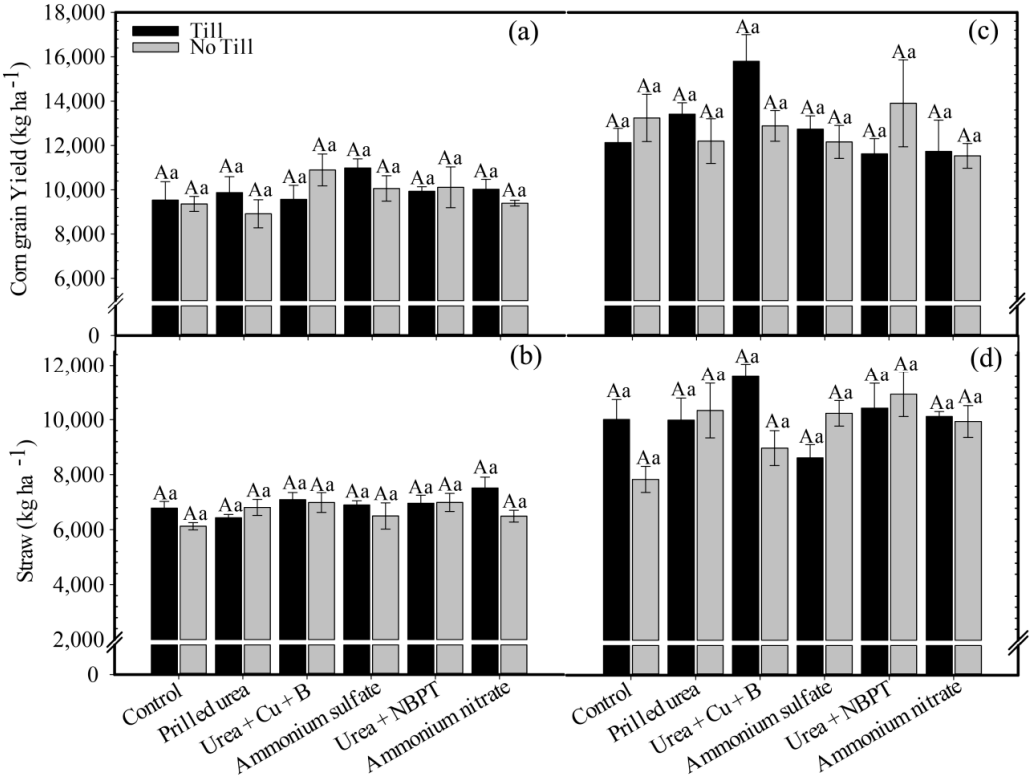

Figure S6. – Corn grain yield and straw production in the 2017/2018 (a and b) and 2018/2019 (c and d) crop seasons that received N top dressing fertilization. Treatments followed by the same upper letter in the bars do not differ within tillage systems (NT and T) and followed by the same lower letter do not differ within N sources at 5 % significance level by the Scott-Knott test. The vertical bars indicate the standard error of the mean (n=3).

Table S1. Soil chemical attributes before the installation of the experiment with 2017/2018 (1º) and 2018/2019 (2º) crop seasons.

Attributes	Till						No-till					
	Soil depth (cm)											
	0-5		5-10		10-20		0-5		5-10		10-20	
	1º	2º	1º	2º	1º	2º	1º	2º	1º	2º	1º	2º
pH (H_20)	5.4	6.2	5.4	6.1	5.1	5.7	6.0	6.9	5.8	5.1	5.3	5.7
P mg dm^{-3}	9.9	6.3	10.9	8.1	11.3	9.9	7.9	4.1	13.6	4.9	10.3	1.2
K mg dm^{-3}	175	88	172	100	152	110	225	154	225	112	170	55
Ca^{2+} $cmol_c dm^{-3}$	3.6	2.7	3.2	3.0	3.1	2.5	5.3	4.7	4.7	2.9	3.5	1.4
Mg^{2+} $cmol_c$ dm^{-3}	1.0	0.8	1.0	0.8	0.8	0.7	1.6	1.5	1.4	0.8	1.0	0.3
CEC $cmol_c dm^{-3}$	7.7	6.3	7.5	6.9	7.5	6.7	9.3	8.4	9.0	6.7	7.8	1.8
OM dag kg^{-1}	3.0	2.6	3.1	2.7	3.1	2.6	4.4	3.7	3.8	2.8	3.3	2.0
NOM dag kg^{-1}	8.3	15.0	10.6	9.3	9.0	10.7	6.3	5.9	5.5	6.8	7.0	9.5
O.C.	1,7	1,4	1,8	1,6	1,8	1,4	2,5	2,1	2,2	1,6	1,9	1,1
P-rem mg L^{-1}	11.6	13	11.1	12	10.4	11.7	11.6	10.5	12.8	8.9	11	5.8

pH in water 1: 2.5 (v/v); Soil available K and P contents extracted by the Mehlich-1 solution; Exchangeable Ca^{2+}, Mg^{2+}; OM: Organic matter determined by the modified Walkley–Black method; NOM: Nitrogen in soil organic matter OC: organic carbon determined by the modified Walkley–Black method, P-rem: Remaining P; CEC: Cation exchange capacity at pH 7.

Table S2. Estimate of the annual mineralization and total availability of N in the studied areas.

Crop Season	System	Depth	Mineralized N[a] (kg ha^{-1} year^{-1})	Mineral N[b] (kg ha^{-1})	Available N[c] (kg ha^{-1})
2017/2018	NT	0-5	50	49	99
		5-10	37	37	74
		10-20	76	34	110
		Total	**59.7**	**38.5**	**98.2**
	T	0-5	33	20	53
		5-10	54	70	124
		10-20	92	20	112
		Total	**67.7**	**32.5**	**100,2**
2018/2019	NT	0-5	32	52	84
		5-10	31	85	116
		10-20	68	128	196
		Total	**49.7**	**98.2**	**147.9**
	T	0-5	58	40	98
		5-10	37	109	146
		10-20	83	125	208
		Total	**65.2**	**99.7**	**164.9**

[a] Estimate of the annual N mineralization, [b] Data compiled from table 2, referring to the sum N-NH_4^+ and N-NO_3^-, [c] Potentially available nitrogen, since it will depend on the mineralization rate.