Appendix A. Basic characteristics of the field soil, sewage sludge, and chicken dung for experiments

Parameter	Soil	GB15618-1995[a)]	Sewage sludge	GB18918-2002[b)]	Chicken dung	GB8172[c)]
Total N (%)	0.0800	—	2.70	—	2.40	—
Total P (%)	0.100	—	3.80	—	2.00	—
Total K (%)	0.300	—	0.200	—	1.80	—
Available N (mg kg^{-1})	80.0	—	—	—	—	—
Olsen-P (mg kg^{-1})	5.50	—	—	—	—	—
Exchangeable-K (mg kg^{-1})	73.0	—	—	—	—	—
Organic matter (%)	1.20	—	35.5	—	20.8	—
pH (soil/water=1:5)	8.90	—	7.50	—	—	—
Water content (%)	—	—	10.0	—	9.53	—
Zn (mg kg^{-1})	46.6	≤ 300	1665	< 3000	660	—
Cu (mg kg^{-1})	17.0	≤ 100	238	< 1500	52.3	—
Cr (mg kg^{-1})	50.0	≤ 250	99.0	< 1000	140	≤ 300
Cd (mg kg^{-1})	0.110	≤ 0.600	1.50	< 20.0	0.200	≤ 3.00
Pb (mg kg^{-1})	10.2	≤ 350	79.0	< 1000	9.90	≤ 100
Ni (mg kg^{-1})	27.0	≤ 60.0	46.0	< 200	21.0	—
As (mg kg^{-1})	10.4	≤ 25.0	20.0	< 75.0	19.4	≤ 30.0
Hg (mg kg^{-1})	0.100	≤ 1.00	13.0	< 15.0	0.400	≤ 5.00

[a)] GB15618-1995: Environmental quality standards for soils of China (pH≥7.5).

[b)] GB18918-2002: Discharge standard of pollutants for municipal wastewater treatment plant of China (pH≥6.5).

[c)] GB8172: Control standards for urban wastes for agricultural use of China.

Appendix B. Annual application rates of chemical fertilizer, sewage sludge (SS), and chicken dung (CD) in different treatments for wheat and maize rotation system

Treatments[1)]	Fertilizer			Basal fertilization for wheat		Topdressing for wheat	Topdressing for maize
	N ($kg\ ha^{-1}$)	P ($kg\ ha^{-1}$)	K ($kg\ ha^{-1}$)	SS ($t\ ha^{-1}$)	CD ($t\ ha^{-1}$)	N ($kg\ ha^{-1}$)	N ($kg\ ha^{-1}$)
CK	0	39.3	99.6	0	0	0	0
0.5N	30.0	39.3	99.6	0	0	60.0	90.0
1N	60.0	39.3	99.6	0	0	120	180
0.5SS+0.5N	30.0	39.3	99.6	4.50	0	60.0	90.0
1SS+0.5N	30.0	39.3	99.6	9.00	0	60.0	90.0
2SS+0.5N	30.0	39.3	99.6	18.0	0	60.0	90.0
4SS+0.5N	30.0	39.3	99.6	36.0	0	60.0	90.0
1CD+0.5N	30.0	39.3	99.6	0	90	60.0	90.0

Note: N, urea (46% N). P, superphosphate (15% P_2O_5). K, potassium sulfate (50% K_2O).

[1)] Eight treatments: three with SS-unamended soil (CK, blank control; 0.5N, 30.0 kg ha^{-1} urea; 1N, 60.0 kg ha^{-1} urea), four with different SSA rates (0.5SS+0.5N, 1SS+0.5N, 2SS+0.5N and 4SS+0.5N: 4.5, 9.0, 18.0 and 36.0 t ha^{-1}, respectively) and one with an addition of chicken dung (1CD+0.5N, 90.0 t ha^{-1}).

Appendix C. The contents of heavy metals in soils at different treatments from 2007 to 2016 (except for 2105) (Mean ± SE)

Year	Treatments[1)]	Heavy metal (mg kg^{-1})							
		Zn	Cu	Cr	Ni	Cd	Pb	As	Hg
2007	CK	42.0±0.2 a	17.1±0.4 a	66.6±6.7 a	32.9±2.8a	0.124±0.004 a	10.4±0.2 a	10.1±0.2 a	0.09±0.01 a
	0.5N	41.5±0.0 a	16.7±0.4 a	53.9±4.0 a	27.7±1.6 a	0.111±0.008 a	10.1±0.2 a	10.4±0.3 a	0.11±0.02 a
	1N	42.8±1.1 a	16.6±0.3 a	52.4±11 a	30.0±1.5 a	0.114±0.006 a	9.13±1.4 a	10.3±0.7 a	0.14±0.04 a
	0.5SS+0.5N	46.3±2.1 a	17.5±0.5 a	65.7±6.8 a	32.0±2.3 a	0.111±0.008 a	10.6±0.3 a	10.4±0.4 a	0.15±0.01 a
	1SS+0.5N	50.4±2.1 a	17.8±0.2 a	55.6±6.8 a	28.3±2.6 a	0.110±0.003 a	10.4±0.4 a	10.4±0.2 a	0.23±0.02 a
	2SS+0.5N	67.4±2.6 b	19.5±1.1 b	51.9±3.5 a	26.6±2.0 a	0.118±0.010 a	11.5±0.5 b	10.8±0.4 a	0.50±0.19 b
	4SS+0.5N	74.7±8.6 b	20.0±1.4 b	51.4±2.6 a	26.8±1.0 a	0.135±0.004 b	11.7±0.8 b	11.1±0.2 b	0.62±0.37 b
	1CD+0.5N	45.0±0.8 a	16.6±0.5 a	48.0±0.2 a	25.5±0.0 a	0.123±0.012 a	10.1±0.2 a	10.6±0.2 a	0.14±0.03 a
2008	CK	46.2±2.7 a	14.3±1.4 bc	18.9±0.7 b	9.68±0.1b c	0.144±0.03 a	16.4±0.4 a	8.15±0.4 a	0.06±0.02 a
	0.5N	49.3±2.6 ab	12.4±1.2 b	20.3±0.4 b	10.29±0.4 c	0.126±0.01 a	16.5±0.7 a	8.32±0.1 a	0.08±0.04 a
	1N	54.5±5.1 ab	12.6±0.4 b	18.5±0.7 b	9.86±0.2 bc	0.125±0.01 a	16.5±0.9 a	8.74±0.4 a	0.13±0.02 a
	0.5SS+0.5N	57.1±3.7 ab	12.0±0.3 ab	19.1±1.1 b	9.89±0.6 bc	0.120±0.01 a	15.8±0.1 a	8.67±0.4 a	0.16±0.01 a
	1SS+0.5N	57.2±3.1 ab	11.9±0.5 ab	19.1±0.9 b	9.52±0.3 b	0.116±0.01 a	15.9±0.3 a	8.55±0.3 a	0.12±0.10 a
	2SS+0.5N	79.1±9.2 c	13.9±1.0 b	18.9±0.4 b	0.54±0.3 b	0.140±0.01 a	16.2±0.2 a	8.44±0.3 a	0.26±0.08 b
	4SS+0.5N	112±8.1 d	18.5±1.8 d	19.2±2.4 b	9.79±0.4 bc	0.187±0.01 b	16.4±0.2 a	8.29±0.7 a	0.70±0.00 c
	1CD+0.5N	62.4±6.1 b	10.2±1.2 a	15.9±1.5 a	7.95±0.4 a	0.126±0.01 a	16.1±0.5 a	8.49±0.6 a	0.14±0.00 a
2009	CK	55.8±0.2 a	16.5±0.89 a	25.8±0.3 a	12.2±0.2 a	0.115±0.01 a	9.90±0.3 a	3.25±0.2 ab	0.026±0.00 a
	0.5N	54.1±0.8 a	17.0±1.66 a	26.2±0.5 ab	13.0±0.2 ab	0.122±0.01 a	11.4±0.3 ab	4.73±0.2 de	0.064±0.02 a
	1N	54.1±2.3 a	14.0±0.60 a	26.4±0.3 ab	13.7±0.3 b	0.123±0.01 a	12.2±0.4 bc	3.61±0.1 bc	0.034±0.00 a
	0.5SS+0.5N	60.8±1.7 a	16.8±1.54 a	26.5±0.4 ab	15.0±0.2 c	0.123±0.00 a	14.6±0.1 c	4.19±0.6 cd	0.17±0.04 b
	1SS+0.5N	78.6±1.6 b	22.3±1.12 b	27.6±0.4 b	16.9±0.3 d	0.128±0.1a b	15.8±0.6 d	2.48±0.4 a	0.20±0.02 b
	2SS+0.5N	102±5.8 c	24.4±1.22 b	29.9±0.01 c	20.0±0.7 f	0.152±0.00 b	18.4±0.3 e	5.38±0.1 e	0.37±0.03 c
	4SS+0.5N	157±7.8 d	31.1±0.61 c	30.5±0.9 c	18.7±0.1 e	0.210±0.02 c	21.4±0.7 f	5.26±0.4 e	0.82±0.08 d
	1CD+0.5N	55.8±1.8 a	14.5±2.04 a	30±0.2 c	20.1±0.2 f	0.138±0.01 ab	21.1±0.7 f	2.82±0.1 ab	0.049±0.01 a

2010	CK	87.5±7.2 ab	21.2±0.4 ab	55.8±0.9 bc	25.8±0.4 a	0.197±0.005 a	19.1±3.2 b	9.09±0.04 a	0.057±0.01 a
	0.5N	77.0±11 ab	21.0±0.6 ab	53.7±0.4 abc	25.3±0.3 a	0.198±0.008 a	21.8±4.0b c	9.25±0.42 ab	0.11±0.03 a
	1N	61.0±2.7 a	19.0±0.6 ab	51.9±0.2 ab	25.2±1.1 a	0.198±0.011 a	30.1±3.5 d	9.20±0.27 a	0.086±0.03 a
	0.5SS+0.5N	88.0±6.6 ab	22.9±0.8 a	53.9±0.8 abc	27.4±1.0 a	0.215±0.008 a	7.60±2.9 a	9.40±0.56 a	0.20±0.06 a
	1SS+0.5N	99.2±4.1 ab	24.3±2.4 bc	50.9±2.3 a	26.2±2.6 a	0.213±0.008 a	17.0±2.3 b	9.95±0.23 ab	0.41±0.03 b
	2SS+0.5N	128±8.3 c	30.9±2.1 c	56.1±1.3 bc	33.9±3.1 a	0.272±0.002 b	25.4±8.8 d	10.6±0.42 bc	0.69±0.12 c
	4SS+0.5N	248±13 d	42.4±5.3 d	57.6±2.3 c	29.4±2.0 a	0.333±0.030 c	29.4±0.8 cd	11.5±0.31 c	0.99±0.05 d
	1CD+0.5N	70.3±8.7 ab	16.5±0.4 a	53.2±0.7 abc	25.3±0.3 a	0.231±0.003 a	17.0±2.0 b	9.44±0.22 a	0.054±0.03 a
2011	CK	59.2±1.8 a	17.3±0.7 a	79.6±1.1 a	27.0±0.8 a	0.18±0.24 a	17.2±0.8 ab	8.65±0.51 ab	0.017±0.20 a
	0.5N	54.0±0.9 a	17.3±0.7 a	78.3±1.2 a	16.5±0.6 a	0.19±0.20 a	17.6±0.7 ab	8.76±0.79 ab	0.057±0.16 a
	1N	55.2±0.9 a	17.2±0.3 a	76.1±0.5 a	26.4±0.4 a	0.19±0.13 a	17.4±0.3 ab	8.57±0.71 ab	0.041±0.14 a
	0.5SS+0.5N	72.5±0.8 a	18.9±0.8 a	76.3±1.0 a	26.5±0.8 a	0.19±0.11 a	17.1±0.8 ab	8.15±1.01 ab	0.17±0.35 b
	1SS+0.5N	79.4±1.7 ab	20.5±1.1 a	76.8±1.3 a	26.7±0.9 a	0.21±0.23 a	16.9±0.6 ab	8.67±0.95 ab	0.34±0.40 c
	2SS+0.5N	113±2.6 b	25.5±1.5 b	76.1±1.5 a	27.1±0.9 a	0.23±0.28 b	18.3±1.2 b	9.33±0.60 ab	1.00±0.44 d
	4SS+0.5N	176±2.9 c	33.4±1.3 c	80.3±0.8 a	27.1±0.7 a	0.27±0.25 c	16.6±0.6 a	9.11±0.94 ab	1.02±0.42 d
	1CD+0.5N	61.7±1.2 a	17.1±0.8 a	79.6±0.8 a	26.3±0.8 a	0.20±0.14 a	17.3±0.8 ab	7.84±0.97 a	0.045±0.28 a
2012	CK	36.8±0.970 b	49.9±2.67 c	29.8±1.06 ab	18.8±0.678 a	0.0953±0.00767 c	15.4±0.743 bc	2.84±0.155 a	N.D.
	0.5N	50.3±10.6 b	59.9±3.05 ab	29.0±0.714 ab	19.7±1.20 a	0.113±0.00514 c	15.6±0.701 bc	3.43±0.581 a	N.D.
	1N	33.5±1.30 b	47.3±7.76 c	29.4±0.723 ab	17.9±1.30 a	0.0896±0.00811 c	15.3±1.06 bc	2.84±0.216 a	N.D.
	0.5SS+0.5N	42.2±4.21 b	45.3±6.11 c	24.3±2.19 b	16.1±1.70 a	0.0924±0.00898 c	13.6±1.22 c	2.76±0.224 a	N.D.
	1SS+0.5N	60.5±6.55 b	60.5±8.37 ab	28.7±1.74 ab	18.6±1.46 a	0.113±0.00262 c	16.1±0.623 bc	3.10±0.433 a	N.D.
	2SS+0.5N	132±36.6 a	59.9±4.98 ab	29.6±1.25 ab	19.3±0.531 a	0.146±0.00887 b	18.1±1.64 ab	4.70±1.69 a	N.D.
	4SS+0.5N	135±9.39 a	72.9±8.10 a	30.0±0.531 ab	20.3±1.49 a	0.173±0.00927 a	20.8±0.935 a	3.21±0.140 a	N.D.
	1CD+0.5N	41.1±5.98 b	42.6±4.03 c	31.1±4.05 a	17.5±1.55 a	0.105±0.0127 bc	14.3±0.216 c	3.06±0.519 a	N.D.
2013	CK	46.3±5.25 b	21.1±0.632 de	83.9±15.9 a	18.2±3.12 a	0.129±0.00702 a	20.8±1.55 a	4.36±1.13 a	N.D.
	0.5N	39.9±1.96 b	20.5±0.502 de	59.0±0.911 a	14.2±0.415 a	0.122±0.00410 a	22.0±1.30 a	2.78±0.295 a	N.D.
	1N	36.1±0.884 b	19.6±0.414 e	63.4±6.73 a	14.0±0.316 a	0.114±0.00702 a	21.7±1.22 a	2.94±0.137 a	N.D.
	0.5SS+0.5N	55.5±1.42 b	23.2±0.1.26 cd	70.9±5.96 a	13.9±0.633 a	0.143±0.0215 a	23.3±3.02 a	6.65±3.75 a	N.D.

	1SS+0.5N	63.9±3.24 b	24.6±0.928 c	64.5±11.2 a	13.5±0.391 a	0.133±0.00701 a	22.9±2.26 a	3.09±0.176 a	N.D.
	2SS+0.5N	197±60.7 a	31.1±1.04 b	65.6±10.5 a	13.6±0.459 a	0.176±0.00723 a	24.8±2.22 a	2.32±0.690 a	N.D.
	4SS+0.5N	173±6.51 a	45.6±2.00 a	67.8±1.72 a	13.8±0.328 a	0.243±0.00630 a	31.6±0.353 a	3.32±0.268 a	N.D.
	1CD+0.5N	57.3±4.34 b	21.3±0.902 cde	88.2±16.9 a	16.5±2.58 a	1.21±1.05 a	27.4±10.3 a	3.73±1.03 a	N.D.
2014	CK	78.7±13.9 d	20.7±0.237 e	151±1.40 ab	27.9±0.157 ab	0.194±0.0276 cd	20.8±0.804 b	10.2±0.750 a	N.D.
	0.5N	72.1±8.72 d	22.0±0.981 de	147±12.0 ab	28.6±0.737 ab	0.182±0.0118 cd	21.8±1.21 b	9.67±0.799 a	N.D.
	1N	64.2±2.26 d	20.9±0.612 e	142±4.94 ab	28.0±0.609 ab	0.171±0.00712 cd	21.4±0.795 b	9.02±0.840 a	N.D.
	0.5SS+0.5N	104±6.50 d	26.5±0.776 d	142±2.84 ab	27.6±0.588 ab	0.203±0.00556 cd	22.2±0.649 b	9.24±0.293 a	N.D.
	1SS+0.5N	168±6.55 c	32.4±2.00 c	166±12.1 a	31.0±2.11 a	0.251±0.0122 bc	24.5±2.19 b	10.7±1.29 a	N.D.
	2SS+0.5N	242±24.3 b	42.0±3.62 b	138±5.85 ab	29.1±0.255 ab	0.301±0.0117 ab	26.5±0.0839 ab	10.0±0.79 a	N.D.
	4SS+0.5N	329±5.70 a	48.3±0.185 a	139±6.78 ab	28.8±0.385 ab	0.369±0.00790 a	30.9±0.453 a	10.8±0.467 a	N.D.
	1CD+0.5N	67.2±19.7 d	21.8±1.32 de	126±24.8 b	20.0±7.86 a	0.152±0.0730 d	23.7±4.23 b	9.21±0.64 a	N.D.
2016	CK	67.9±0.922 e	15.2±0.797 e	64.4±1.36 a	14.7±1.78 ab	0.405±0.00581 a	50.8±2.07 a	8.49±0.320 bc	0.0209±0.000446 c
	0.5N	74.9±5.31d e	16.4±0.1.04 e	66.3±0.259 a	22.2±6.52 b	0.352±0.0210 ab	45.0±1.05 b	9.91±0.232 ab	0.0269±0.00269 c
	1N	66.6±0.831 e	18.0±0.0.023 de	64.5±1.18 a	26.7±1.36 a	0.341±0.0327 abc	38.9±1.67 c	9.13±0.484 bc	0.0226±0.00112 c
	0.5SS+0.5N	91.6±6.11 cd	20.4±0.277 cd	66.0±0.580 a	28.2±0.916 a	0.318±0.0279 abc	36.4±0.783 cd	9.15±0.782 bc	0.0473±0.00324 ab
	1SS+0.5N	105±1.15 c	22.5±1.15 c	64.8±0.158 a	29.1±2.63 a	0.235±0.00765 cd	33.1±0.168 d	8.49±0.554 bc	0.0450±0.00434 ab
	2SS+0.5N	134±7.46 b	26.1±1.27 b	64.4±0.955 a	27.5±3.85 a	0.252±0.0416 bcd	33.3±1.36 d	9.29±0.250 bc	0.0487±0.0126 a
	4SS+0.5N	194±11.1 a	34.3±1.57 a	65.8±0.510 a	28.0±1.26 a	0.273±0.0293 bc	34.6±1.74 d	10.8±0.510 a	0.0311±0.00149 bc
	1CD+0.5N	80.1±1.77 de	17.8±0.779 de	64.0±0.141 a	24.5±0.728 a	0.157±0.0107 d	22.5±0.937 e	7.88±0.298 bc	0.0280±0.00411 c
GB15618-1995		300	100	250	60	0.6	350	25	1

[1)] Eight treatments: three with SS-unamended soil (CK, blank control; 0.5N, 30.0 kg ha^{-1} urea; 1N, 60.0 kg ha^{-1} urea), four with different SSA rates (0.5SS+0.5N, 1SS+0.5N, 2SS+0.5N and 4SS+0.5N: 4.5, 9.0, 18.0 and 36.0 t ha^{-1}, respectively) and one with an addition of chicken dung (1CD+0.5N, 90.0 t ha^{-1}).

Data followed by the same letter(s) within each row are not significantly different at $P<0.05$ by the least significant difference test.

N.D.: Data not available.

GB15618-1995: Environmental quality standards for soils of China (pH≥7.5).

Appendix D. Correlations analysis between the contents of heavy metals and SSA rates in soils from 2007 to 2016 (except for 2015)

Metal	GB15618-1995 (mg kg^{-1})	Linear regression equation	Linear correlation coefficients (R^2)	Service life (year)
Hg	1.0	y=0.00620x+0.132	0.838**	18
Zn	300	y=0.619x+61.3	0.675**	51
Cu	100	y=0.0929x+21.7	0.291**	112
Pb	350	y=0.0492x+17.1	0.263**	902
Cd	1.0	y=0.000500x+0.157	0.280**	224

** means $P<0.01$, indicated the R^2 is significant at 0.01 level. Use fixed number of year is no more than secondary soil environmental quality standard, calculated in accordance with the agricultural mud quality standard (CJ/T309-2009) : the number of SS can be applied to soils is 7.5 t ha^{-1} a year.

Appendix E. The contents of heavy metals in wheat grain and straw at different treatments in 2016 (Mean ± SE)

Item	Treatments[1)]	Heavy metal (mg kg^{-1})							
		Zn	Cu	Cr	Ni	Cd	Pb	As	Hg
Grain	CK	28.9±0.630 bc	3.37±0.494 a	1.12±0.0897 a	1.23±0.131 a	0.0140±0.00182 b	0.191±0.0245 a	0.0520±0.00499 a	0.00928±0.0000902 a
	0.5N	29.4±0.583 bc	1.81±0.771 ab	0.674±0.0707 a	0.454±0.117 a	0.00867±0.00144 b	0.172±0.0465 a	0.0481±0.0594 a	0.00802±0.000137 cd
	1N	31.9±2.46 b	1.94±1.01 ab	0.858±0.195 a	0.708±0.0530 a	0.00709±0.00140 b	0.0894±0.0677 a	0.0494±0.0294 a	0.00839±0.0000443 bc
	0.5SS+0.5N	24.3±1.34 d	1.83±0.437 ab	0.565±0.0412 a	0.762±0.00 a	0.00799±0.00226 b	0.112±0.0224 a	0.0841±0.0577 a	0.00767±0.000122 d
	1SS+0.5N	26.7±0.952 cd	N.D.	0.654±0.0343 a	0.507±0.0368 a	0.00594±0.00105 b	0.109±0.0161 a	0.0334±0.00454 a	0.00778±0.000425 cd
	2SS+0.5N	32.1±1.42 b	2.39±0.336 ab	1.17±0.644 a	0.590±0.208 a	0.00392±0.000494 b	0.104±0.00723 a	0.0189±0.00319 a	0.00831±0.000122 bcd
	4SS+0.5N	43.3±1.76 a	1.28±0.364 bc	0.552±0.0219 a	0.625±0.00 a	0.00492±0.00116 b	0.104±0.0133 a	0.0180±0.00277 a	0.00837±0.000131 bc
	1CD+0.5N	32.4±1.08 b	N.D.	0.673±0.0960 a	0.522±0.121 a	0.00396±0.000924 b	0.122±0.0257 a	0.0243±0.00409 a	0.00872±0.000200 ab
Straw	CK	14.6±4.38 a	3.56±0.404 b	2.00±0.00636 a	0.471±0.0529 b	0.0211±0.00162 bc	0.448±0.0198 b	0.0738±0.00451 c	0.00144±0.0000967 a
	0.5N	13.4±4.55 a	6.87±0.903 ab	2.23±0.187 a	0.690±0.0710 b	0.0196±0.00141 c	0.560±0.0540 b	0.0856±0.00705 ab	0.00141±0.0000846 ab
	1N	15.9±2.56 ab	7.42±0.653 a	2.13±0.149 a	0.656±0.361 b	0.0306±0.000915 a	0.500±0.0421 b	0.0932±0.00295 a	0.00133±0.000126 abc
	0.5SS+0.5N	17.0±0.892 ab	5.40±0.433 b	1.91±0.293 a	0.579±0.0977 a	0.0196±0.00176 c	0.444±0.0200 b	0.0638±0.00177 c	0.00108±0.0000383 d
	1SS+0.5N	15.7±0.787 ab	5.10±1.09 b	2.10±0.272 a	0.716±0.177 b	0.0212±0.00115 bc	0.516±0.0142 b	0.0833±0.00241 ab	0.00116±0.0000396c d
	2SS+0.5N	19.3±1.25 ab	4.13±2.53 b	2.22±0.134 a	0.690±0.114 b	0.0152±0.000750 c	0.453±0.0755 b	0.0947±0.000969a	0.00113±0.0000500 cd
	4SS+0.5N	24.6±2.35 a	3.20±0.618 b	2.34±0.0909 a	0.977±0.108 b	0.0210±0.000773 bc	0.549±0.0271 b	0.0834±0.00683 ab	0.00121±0.00000891 bcd
	1CD+0.5N	20.8±2.09 ab	2.05±0.159 b	2.11±0.285 a	1.23±0.176 b	0.0274±0.00291 ab	0.764±0.0884 a	0.0869±0.0116 ab	0.00123±0.0000162 abcd
	GB2762-2017	—	—	—	1	0.1	0.2	0.5	0.02

[1)] Eight treatments: three with SS-unamended soil (CK, blank control; 0.5N, 30.0 kg ha^{-1} urea; 1N, 60.0 kg ha^{-1} urea), four with different SSA rates (0.5SS+0.5N, 1SS+0.5N, 2SS+0.5N and 4SS+0.5N: 4.5, 9.0, 18.0 and 36.0 t ha^{-1}, respectively) and one with an addition of chicken dung (1CD+0.5N, 90.0 t ha^{-1}).

Data followed by the same letter(s) within each row are not significantly different at $P<0.05$ by the least significant difference test.

N.D.: Data not detectable.

GB2762-2017: Food safety standards of China.

Appendix F. The contents of heavy metals in wheat grain from 2007 to 2016 (except for 2012) (Mean ± SE)

Year	Treatments[1)]	Heavy metal (mg kg^{-1})							
		Zn	Cu	Cr	Ni	Cd	Pb	As	Hg
2007	CK	18.0±1.0 a	4.43±0.2 ab	0.82±0.3 a	0.42±0.05 a	0.025±0.004 bc	0.13±0.02 a	0.06±0.01 a	0.015±0.003 a
	0.5N	20.3±1.5 a	4.67±0.7 ab	0.51±0.2 a	0.17±0.06 a	0.026±0.002 c	0.09±0.02 a	0.06±0.01 a	0.013±0.003 a
	1N	23.7±1.9 b	5.34±0.5 bc	0.41±0.2 a	0.12±0.02 a	0.032±0.003 c	0.08±0.01 a	0.06±0.01 a	0.012±0.004 a
	0.5SS+0.5N	27.2±0.3 c	5.15±0.7 bc	0.45±0.3 a	0.10±0.04 a	0.024±0.003 bc	0.09±0.01 a	0.07±0.02 a	0.013±0.003 a
	1SS+0.5N	29.5±0.4 d	5.66±0.6 c	0.82±0.1 a	0.10±0.02 a	0.020±0.001 ab	0.08±0.01 a	0.06±0.01 a	0.011±0.001 a
	2SS+0.5N	33.5±1.7 e	5.64±0.3 c	0.87±0.1 a	0.11±0.01 a	0.024±0.004 bc	0.11±0.01 a	0.07±0.01 ab	0.011±0.003 a
	4SS+0.5N	42.8±1.1 f	6.01±0.4 c	0.90±0.1 a	0.09±0.02 a	0.027±0.001 ab	0.11±0.02 a	0.07±0.01 ab	0.010±0.001 a
	1CD+0.5N	20.5±1.1 ab	3.79±0.4 a	0.98±0.1 a	0.14±0.07 a	0.018±0.002 a	0.10±0.01 a	0.09±0.01 b	0.010±0.003 a
2008	CK	16.7±2.4 a	3.94±0.2 a	0.22±0.001 ab	0.27±0.08 c	0.029±0.032 a	0.13±0.02 a	0.021±0.005 a	0.0027±0.0001 a
	0.5N	19.4±3.4 ab	4.33±0.5 ab	0.45±0.05 b	0.14±0.05 b	0.021±0.001 a	0.09±0.02 a	0.025±0.003 ab	0.0081±0.0071 a
	1N	23.8±4.2 b	4.63±0.5 b	0.79±0.24 c	0.35±0.02 d	0.035±0.016 a	0.08±0.01 a	0.034±0.017 ab	0.0087±0.0077 a
	0.5SS+0.5N	24.9±3.4 b	4.72±0.2 b	0.12±0.001 a	0.09±0.03 ab	0.027±0.018 a	0.09±0.01 a	0.027±0.010 ab	0.0080±0.0051 a
	1SS+0.5N	29.6±6.7 bc	4.90±0.7 b	0.29±0.15 ab	0.22±0.07 c	0.029±0.030 a	0.08±0.01 a	0.024±0.004 a	0.0092±0.0081 a
	2SS+0.5N	33.9±1.2 c	4.95±0.1 b	0.16±0.11 ab	0.05±0.06 a	0.049±0.057 a	0.11±0.01 a	0.029±0.005 ab	0.0055±0.0066 a
	4SS+0.5N	36.6±1.5 cd	5.01±0.1 b	0.18±0.05 ab	0.11±0.00 ab	0.041±0.047 a	0.11±0.02 a	0.032±0.004 ab	0.0055±0.0044 a
	1CD+0.5N	21.9±1.5 ab	3.83±0.2 a	0.19±0.16 ab	0.06±0.06 ab	0.036±0.031 a	0.10±0.01 a	0.041±0.007 b	0.0046±0.0030 a
2009	CK	21.8±0.98 a	4.76±0.12 bc	0.247±0.023 d	0.226±0.028 c	0.0145±0.0013 bc	0.109±0.006 ab	0.017±0.002 a	0.00024±0.00002 a
	0.5N	21.5±3.46 a	5.25±0.16 ab	0.309±0.000 e	0.067±0.0009 ab	0.0124±0.0025 abc	0.199±0.000 b	0.034±0.005 c	0.00050±0.00006 b
	1N	18.0±1.42 a	4.28±0.18 ab	0.018±0.000 a	0.066±0.001 ab	0.0162±0.0015 c	0.049±0.013 a	0.033±0.0005 c	0.00062±0.00004 c
	0.5SS+0.5N	29.1±2.54 a	5.24±0.35 c	0.065±0.024 b	0.047±0.006 ab	0.0091±0.0004 a	0.065±0.000 a	0.030±0.002 bc	0.00057±0.00001 bc
	1SS+0.5N	37.4±0.80 c	5.10±0.14 c	0.202±0.000 c	0.049±0.020 ab	0.0094±0.0013 a	0.196±0.074 b	0.029±0.005 bc	0.00072±0.00003 d
	2SS+0.5N	40.7±3.110 c	5.26±0.01 c	0.064±0.014 b	0.037±0.004 a	0.0097±0.0011 ab	0.130±0.000 ab	0.03±0.003 bc	0.00084±0.00004 e
	4SS+0.5N	42.5±0.21 c	4.63±0.11 bc	0.289±0.043 e	0.058±0.020 ab	0.0107±0.0004 ab	0.29±0.073 c	0.019±0.0004 b	0.00084±0.00003 e
	1CD+0.5N	23.2±1.25 ab	3.79±0.46 a	0.168±0.000 c	0.08±0.007 b	0.0076±0.0019 a	0.122±0.040 ab	0.045±0.005 d	0.00074±0.00002 d
2010	CK	25.5±3.2 ab	2.78±0.49 a	0.22±0.9a	0.22±0.03 ab	0.0067±0.0022 a	N.D.	0.028±0.003 ab	0.0035±0.0001 a

	0.5N	26.0±2.7 ab	3.89±0.47 ab	0.95±0.5 a	0.19±0.03 a	0.0072±0.0012 ab	N.D.	0.014±0.002 a	0.0036±0.0008 a
	1N	30.5±1.9 b	4.88±0.13 b	0.47±0.8 a	0.33±0.07 b	0.0088±0.0015 ab	N.D.	0.036±0.004 bcd	0.0030±0.0009 a
	0.5SS+0.5N	37.4±1.2 c	4.36±0.44 ab	0.18±1.1 a	0.20±0.02 a	0.0066±0.0014 a	N.D.	0.039±0.000 bcd	0.0027±0.0011 a
	1SS+0.5N	42.1±2.5 cd	3.78±0.57 ab	0.37±1.1 a	0.21±0.04 a	0.0113±0.0019 b	N.D.	0.050±0.005 d	0.0028±0.0013 a
	2SS+0.5N	46.7±0.8 d	4.12±1.07 ab	0.20±0.2 a	0.15±0.02 a	0.0057±0.0009 a	N.D.	0.040±0.005 bcd	0.0033±0.0018 a
	4SS+0.5N	55.5±2.3 e	4.52±0.75 ab	0.38±1.0 a	0.20±0.04 a	0.0051±0.0011 a	N.D.	0.032±0.005 bc	0.0026±0.0012 a
	1CD+0.5N	20.1±1.5 a	3.22±0.06 ab	0.38±1.2 a	0.24±0.04 ab	0.0098±0.0011 ab	N.D.	0.046±0.015 cd	0.0027±0.0007 a
2011	CK	21.6±0.5 a	3.67±0.3 a	0.35±0.1 a	0.14±0.03 ab	0.0210±0.005 b	0.086±0.003 a	0.019±0.003 a	0.00060±0.0004 ab
	0.5N	23.3±2.2 a	4.67±1.0 abc	0.38±0.1 a	0.11±0.03 ab	0.0206±0.003 b	0.106±0.05 a	0.013±0.003 a	0.00066±0.0002 a
	1N	29.3±3.7 b	4.91±0.2 abc	0.45±0.2 a	0.17±0.12 ab	0.0271±0.003 c	0.110±0.04 a	0.028±0.02 a	0.00086±0.0002 b
	0.5SS+0.5N	36.0±0.8 c	4.25±0.3 ab	0.40±0.2 a	0.10±0.03 ab	0.0173±0.002 ab	0.059±0.01 a	0.019±0.007 a	0.00122±0.0003 ab
	1SS+0.5N	41.4±4.1 d	4.65±0.5 abc	0.44±0.1 a	0.19±0.07 ab	0.0152±0.001 a	0.103±0.03 a	0.028±0.03 a	0.00088±0.00003 ab
	2SS+0.5N	50.3±4.1 e	5.85±0.9 c	0.59±0.1 a	0.23±0.03 b	0.0144±0.0004 a	0.102±0.02 a	0.051±0.05 a	0.00076±0.0002 a
	4SS+0.5N	61.2±3.9 f	5.38±1.3 bc	0.41±0.0 a	0.10±0.04 a	0.0152±0.002 ab	0.084±0.03 a	0.086±0.12 a	0.00068±0.0002 ab
	1CD+0.5N	30.1±1.8 b	3.86±0.192 a	0.35±0.2 a	0.12±0.04 ab	0.0134±0.001 a	0.074±0.01 a	0.023±0.005 a	0.00073±0.0002 a
2013	CK	15.4±0.924 d	5.34±0.712 a	0.554±0.0239 a	0.479±0.166 a	0.00779±0.000720 a	0.0862±0.0203 a	0.0146±0.00124 b	N.D.
	0.5N	16.0±1.04 d	5.12±0.615 a	0.550±0.0300 a	0.185±0.0693 a	0.00634±0.000559 a	0.0458±0.00488 b	0.0186±0.00296 b	N.D.
	1N	18.4±1.34 cd	7.67±0.886 a	0.547±0.0204 a	1.16±0.792 a	0.0100±0.00191 a	0.0460±0.00763 b	0.0183±0.00300 b	N.D.
	0.5SS+0.5N	20.7±0.740 c	6.05±0.977 a	0.57±0.0581 a	0.267±0.108 a	0.00592±0.000798 a	0.0513±0.00561 b	0.0233±0.00399 b	N.D.
	1SS+0.5N	25.4±1.40 b	6.16±0.944 a	0.621±0.0345 a	0.412±0.246 a	0.00606±0.00111 a	0.0495±0.00101 b	0.0183±0.00240 b	N.D.
	2SS+0.5N	32.6±2.84 a	9.16±3.25 a	0.604±0.0340 a	0.267±0.0472 a	0.00816±0.00247 a	0.0543±0.000948 b	0.0300±0.0160 b	N.D.
	4SS+0.5N	39.7±1.87 a	6.47±0.687 a	0.573±0.0313 a	0.193±0.0187 a	0.00579±0.000298 a	0.0502±0.00205 b	0.0184±0.00239 b	N.D.
	1CD+0.5N	19.3±0.238 c	5.69±0.770 a	0.600±0.0149 a	0.340±0.141 a	0.00536±0.000619 a	0.0489±0.00542 b	0.0479±0.00142 a	N.D.
2014	CK	20.1±2.71 de	4.63±1.06 a	4510.940±0.05 a	0.566±0.00914 a	0.0145±0.00142 a	0.0735±0.00366 ab	0.0173±0.00151 a	N.D.
	0.5N	17.4±1.36 e	5.45±0.362 a	0.974±0.0584 a	0.566±0.0703 a	0.0137±0.00295 a	0.0869±0.0149 ab	0.0171±0.00325 a	N.D.
	1N	22.9±1.83 cd	5.90±0.634 a	0.834±0.0220 a	0.414±0.0377 a	0.0173±0.00171 a	0.0799±0.00372 a	0.0244±0.00201 a	N.D.
	0.5SS+0.5N	24.7±4.43 c	5.60±0.802 a	1.03±1.75 a	0.432±0.1.74 a	0.0147±0.00335 a	0.107±0.0150 a	0.0246±0.00411 a	N.D.
	1SS+0.5N	29.4±0.400 c	5.94±0.533 a	1.07±0.198 a	0.641±0.128 a	0.0127±0.000623 a	0.0654±0.00430 b	0.0218±0.000197 a	N.D.
	2SS+0.5N	33.3±2.91 b	5.35±0.114 a	1.01±0.182 a	0.573±0.195 a	0.0115±0.00139 a	0.0766±0.0197 ab	0.0211±0.000668 a	N.D.

	4SS+0.5N	32.7±9.38 a	6.24±1.72 a	0.853±0.138 a	0.715±0.388 a	0.0130±0.00326 a	0.0689±0.00652 ab	0.0263±0.00818 a	N.D.
	1CD+0.5N	25.6±9.55 e	4.80±1.15 a	1.02±0.265 a	0.315±0.0760 a	0.0118±0.00350 a	0.0733±0.0137 ab	0.0356±0.0106 a	N.D.
2015	CK	26.4±1.61 a	5.04±0.690 b	0.679±0.0535 ab	0.415±0.135 a	0.0204±0.00268 a	0.0809±0.0177 a	0.0320±0.000508 b	N.D.
	0.5N	15.3±0.335 c	5.26±0.816 b	0.543±0.0508 b	0.263±0.0447 a	0.0105±0.000924 b	0.0667±0.0128 a	0.0230±0.00389 b	N.D.
	1N	25.2±2.18 a	9.06±1.39 a	0.635±0.0386 ab	0.540±0.0853 a	0.0140±0.00210 b	0.0838±0.00447 a	0.0293±0.00170 b	N.D.
	0.5SS+0.5N	22.0±1.42 b	6.30±1.66 b	0.635±0.0283 ab	0.430±0.235 a	0.0110±0.00211 b	0.101±0.0352 a	0.0342±0.00414 b	N.D.
	1SS+0.5N	19.5±1.33 b	6.12±1.89 b	0.756±0.0850 a	0.494±0.126 a	0.00963±0.00118 b	0.0977±0.0217 a	0.0305±0.00375 b	N.D.
	2SS+0.5N	24.3±3.10 a	5.43±0.525 b	0.688±0.0557 ab	0.577±0.160 a	0.00841±0.00155 b	0.0761±0.0252 a	0.0323±0.00700 b	N.D.
	4SS+0.5N	32.4±3.54 a	4.88±0.593 b	0.654±0.0568 ab	0.303±0.122 a	0.00786±0.000613 b	0.0543±0.00592 a	0.0318±0.00335 b	N.D.
	1CD+0.5N	23.1±1.93 b	6.64±1.34 ab	0.777±0.0560 a	0.474±0.106 a	0.00868±0.00148 b	0.105±0.0465 a	0.0571±0.00909 a	N.D.
2016	CK	28.9±0.630 bc	3.37±0.494 a	1.12±0.0897 a	1.23±0.131 a	0.0140±0.00182 b	0.191±0.0245 a	0.0520±0.00499 a	0.00928±0.0000902 a
	0.5N	29.4±0.583 bc	1.81±0.771 ab	0.674±0.0707 a	0.454±0.117 a	0.00867±0.00144 b	0.172±0.0465 a	0.0481±0.0594 a	0.00802±0.000137 cd
	1N	31.9±2.46 b	1.94±1.01 ab	0.858±0.195 a	0.708±0.0530 a	0.00709±0.00140 b	0.0894±0.0677 a	0.0494±0.0294 a	0.00839±0.0000443 bc
	0.5SS+0.5N	24.3±1.34 d	1.83±0.437 ab	0.565±0.0412 a	0.762±0.00 a	0.00799±0.00226 b	0.112±0.0224 a	0.0841±0.0577 a	0.00767±0.000122 d
	1SS+0.5N	26.7±0.952 cd	N.D.	0.654±0.0343 a	0.507±0.0368 a	0.00594±0.00105 b	0.109±0.0161 a	0.0334±0.00454 a	0.00778±0.000425 cd
	2SS+0.5N	32.1±1.42 b	2.39±0.3355 ab	1.17±0.644 a	0.590±0.208 a	0.00392±0.000494 b	0.104±0.00723 a	0.0189±0.00319 a	0.00831±0.000122 bcd
	4SS+0.5N	43.3±1.76 a	1.28±0.364 bc	0.552±0.0219 a	0.625±0.00 a	0.00492±0.00116 b	0.104±0.0133 a	0.0180±0.00277 a	0.00837±0.000131 bc
	1CD+0.5N	32.4±1.08 b	N.D.	0.673±0.0960 a	0.522±0.121 a	0.00396±0.000924 b	0.122±0.0257 a	0.0243±0.00409 a	0.00872±0.000200 ab
	GB2762-2017	—	—	—	1	0.1	0.2	0.5	0.02

[1)] Eight treatments: three with SS-unamended soil (CK, blank control; 0.5N, 30.0 kg ha^{-1} urea; 1N, 60.0 kg ha^{-1} urea), four with different SSA rates (0.5SS+0.5N, 1SS+0.5N, 2SS+0.5N and 4SS+0.5N: 4.5, 9.0, 18.0 and 36.0 t ha^{-1}, respectively) and one with an addition of chicken dung (1CD+0.5N, 90.0 t ha^{-1}).

Date followed by the same letter(s) within each row are not significantly different at $P<0.05$ by the least significant difference test.

N.D.: Data not detectable or not available.

GB2762-2017: Food safety standards of China.

Appendix G. The contents of heavy metals in maize grain from 2007 to 2013 (except for 2012) (Mean ± SE)

Year	Treatments[1)]	Heavy metal (mg kg^{-1})							
		Zn	Cu	Cr	Ni	Cd	Pb	As	Hg
2007	CK	16.86±0.4 a	1.46±0.2 a	0.17±0.07 abc	0.18±0.04 c	0.0017±0.001 a	0.086±0.03 a	0.004±0.002 a	0.0027±0.001 ab
	0.5N	16.85±0.2 a	1.51±0.1 a	0.10±0.01 a	0.14±0.04 bc	0.0048±0.002 a	0.112±0.01 b	0.008±0.002 ab	0.0035±0.002 ab
	1N	16.88±0.3 a	1.70±0.01 a	0.12±0.08 ab	0.15±0.07 bc	0.0069±0.008 a	0.084±0.03 a	0.010±0.006 bc	0.0021±0.001 ab
	0.5SS+0.5N	18.77±0.8 b	1.84±0.6 a	0.34±0.01 bcd	0.11±0.01 abc	N.D.	0.062±0.02 a	0.007±0.002 ab	0.0023±0.001 ab
	1SS+0.5N	19.18±0.5 b	1.62±0.2 a	0.41±0.14 d	0.16±0.04 bc	0.0059±0.003 a	0.217±0.04 d	0.009±0.001 bc	0.0020±0.001 ab
	2SS+0.5N	20.40±0.45 c	1.48±0.4 a	0.40±0.2 d	0.06±0.02 a	0.0074±0.003 a	0.150±0.02 c	0.009±0.002 ab	0.0042±0.001 b
	4SS+0.5N	21.63±0.2 d	1.49±0.4 a	0.28±0.05 abcd	0.06±0.01 a	0.0019±0.001 a	N.D.	0.010±0.002 bc	0.0015±0.001 a
	1CD+0.5N	16.74±0.4 a	1.49±0.4 a	0.39±0.17 cd	0.09±0.04 ab	0.0018±0.001 a	N.D.	0.013±0.002 c	0.0032±0.001 ab
2008	CK	14.3±0.05 a	2.04±0.13 a	0.12±0.1 a	0.29±0.14 a	0.022±0.005 c	0.086±0.003 a	0.0047±0.0002 b	0.00087±0.00036 a
	0.5N	14.4±0.67 a	3.12±0.17 b	0.05±0.1 a	0.16±0.09 a	0.010±0.003 b	0.106±0.05 a	0.0123±0.0001 e	0.00051±0.00001 a
	1N	14.7±0.28 a	2.89±0.13 b	0.09±0.2 a	0.13±0.08 a	0.015±0.002 bc	0.110±0.04 a	0.0057±0.0006 bcd	0.0019±0.00015 ab
	0.5SS+0.5N	15.5±0.84 a	2.89±0.30 b	0.08±0.2 a	0.16±0.12 a	0.019±0.004 bc	0.059±0.01 a	0.0087±0.00001 d	0.0030±0.00005 bc
	1SS+0.5N	15.0±0.20 a	3.09±0.27 b	0.11±0.1 a	0.13±0.18 a	0.021±0.005 c	0.103±0.03 a	0.0052±0.0001 bcd	0.0028±0.00051 bc
	2SS+0.5N	17.9±0.86 b	3.30±0.34 b	0.39±0.2 a	0.15±0.08 a	0.024±0.006 c	0.102±0.02 a	0.0085±0.0014 cd	0.0034±0.00089 bc
	4SS+0.5N	18.0±0.97 b	2.99±0.24 b	0.34±0.3 a	0.07±0.14 a	0.012±0.002 ab	0.084±0.03 a	0.0014±0.0001 a	0.0043±0.00083 c
	1CD+0.5N	14.1±0.51 a	2.48±0.27 ab	0.09±0.2 a	0.12±0.01 a	0.004±0.0002 a	0.074±0.01 a	0.0051±0.0028 bc	0.0029±0.00008 bc
2009	CK	21.1±1.2 bcd	1.30±0.28 a	0.91±0.33 c	0.045±0.032 a	N.D.	0.067±0.027 a	0.0073±0.0005 ab	0.00126±0.00005 a
	0.5N	19.3±1.0 ab	1.76±0.14 bc	0.82±0.04 c	0.068±0.033 a	N.D.	0.072±0.043 a	0.0061±0.0009 a	0.00072±0.00012 a
	1N	17.3±0.6 a	1.49±0.14 ab	0.86±0.23 c	0.071±0.001 a	N.D.	0.041±0.012 a	0.0088±0.0001 abc	0.00053±0.00010 a
	0.5SS+0.5N	22.2±0.1 cd	1.75±0.12 bc	0.45±0.004 b	0.197±0.044 b	N.D.	0.076±0.036 a	0.0129±0.0020 bcde	0.00073±0.00020 a
	1SS+0.5N	21.9±0.9 bcde	1.94±0.19 c	0.37±0.29 ab	0.174±0.070 b	N.D.	0.101±0.015 a	0.0143±0.0033 cde	0.00070±0.00012 a
	2SS+0.5N	23.0±0.6 de	1.75±0.02 bc	0.13±0.19 a	N.D.	N.D.	0.062±0.043 a	0.0112±0.0009 abcd	0.00058±0.00028 a
	4SS+0.5N	24.1±0.6 e	1.92±0.07 bc	0.15±0.09 a	N.D.	N.D.	0.091±0.065 a	0.0156±0.0004 de	0.00125±0.00074 a
	1CD+0.5N	20.1±1.1 bc	2.12±0.04 c	0.31±0.22 a	0.103±0.055 ab	N.D.	0.065±0.013 a	0.0180±0.0047 e	0.00111±0.00020 a
2010	CK	21.1±0.7 a	1.69±0.1 a	0.99±0.1 a	0.179±0.03 a	0.00042±0.003 a	N.D.	0.0053±0.002 a	0.0027±0.001 a
	0.5N	22.4±1.0 ab	2.12±0.1 b	1.11±0.3 a	0.172±0.05 a	0.00187±0.001 b	N.D.	0.0037±0.001 a	0.0035±0.002 a
	1N	27.3±2.8 bc	2.52±0.03 c	1.31±0.1 a	0.138±0.01 a	0.00273±0.002 b	N.D.	0.0042±0.001 a	0.0021±0.001 a
	0.5SS+0.5N	21.3±0.5 a	2.37±0.1 c	1.06±0.1 a	0.147±0.05 a	0.00022±0.001 a	N.D.	0.0075±0.003 a	0.0023±0.001 a

	1SS+0.5N	24.2±1.3 ab	2.63±0.1 c	0.69±0.1 a	0.091±0.03 a	0.00221±0.002 b	N.D.	0.0030±0.002 a	0.0020±0.001 a
	2SS+0.5N	30.4±2.0 c	2.95±0.1 d	0.99±0.1 a	0.112±0.00 a	0.00325±0.002 b	N.D.	0.0046±0.000 a	0.0042±0.001 a
	4SS+0.5N	32.7±3.2 c	3.17±0.02 d	1.41±0.7 a	0.172±0.04 a	0.00245±0.002 b	N.D.	0.0040±0.001 a	0.0015±0.001 a
	1CD+0.5N	21.7±0.8 ab	3.61±0.2 e	0.81±0.1 a	0.148±0.02 a	0.00021±0.0001 a	N.D.	0.0069±0.002 a	0.0032±0.001 a
2011	CK	13.7±1.3 ab	1.05±0.15 a	0.13±0.18 a	0.20±0.04 c	0.0025±0.001 a	0.029±0.02 a	0.010±0.010 a	0.00031±0.0002 a
	0.5N	13.1±1.3 a	1.33±0.10 a	0.18±0.09 a	0.10±0.01 ab	0.0019±0.001 a	0.022±0.02 a	0.005±0.002 a	0.00036±0.0002 a
	1N	12.4±1.1 a	1.86±0.42 b	0.13±0.07 a	0.12±0.06 bc	0.0016±0.000 a	0.035±0.01 a	0.015±0.018 a	0.00050±0.0002 a
	0.5SS+0.5N	15.9±0.8 bc	1.39±0.25 ab	0.12±0.00 a	0.13±0.02 abc	0.0090±0.015 a	0.036±0.01 a	0.010±0.007 a	0.00040±0.0002 a
	1SS+0.5N	17.6±0.9 c	1.42±0.18 ab	0.42±0.27 b	0.20±0.07 c	0.0013±0.000 a	0.039±0.01 a	0.007±0.001 a	0.00041±0.0003 a
	2SS+0.5N	18.4±1.2 cd	1.16±0.26 a	0.46±0.03 b	0.19±0.06 bc	0.0016±0.001 a	0.031±0.00 a	0.009±0.001 a	0.00045±0.0003 a
	4SS+0.5N	20.7±1.1 d	1.48±0.42 ab	0.24±0.09 a	0.17±0.08 abc	0.0003±0.000 a	0.018±0.01 a	0.011±0.001 a	0.00031±0.0002 a
	1CD+0.5N	12.7±0.8 a	0.96±0.19 a	0.19±0.01 a	0.09±0.03 a	0.0004±0.000 a	0.019±0.01 a	0.018±0.009 a	0.00022±0.0001 a
2013	CK	23.4±3.83 b	2.50±0.575 a	1.76±0.243 a	0.596±0.172 a	0.0118±0.0052 a	0.314±0.132 a	0.00448±0.00129 a	N.D.
	0.5N	25.7±4.296 b	3.01±1.02 a	1.91±0.263 a	0.855±1.30 a	0.0276±0.0141 a	0.273±0.0418 a	0.00735±0.00140 a	N.D.
	1N	26.3±6.31 b	4.76±1.06 a	2.26±0.240 a	1.22±0.391 a	0.0266±0.0078 a	0.245±0.0514 a	0.0109±000.476 a	N.D.
	0.5SS+0.5N	32.7±3.63 ab	4.33±1.82 a	2.34±0.222 a	0.616±0.0595 a	0.0371±0.0203 a	0.415±0.0779 a	0.00713±0.00306 a	N.D.
	1SS+0.5N	33.1±1.08 ab	2.32±0.135 a	2.66±0.562 a	0.926±0.385 a	0.0397±0.00736 a	0.336±0.130 a	0.00843±0.00294 a	N.D.
	2SS+0.5N	30.1±5.30 ab	4.74±1.83 a	1.74±0.246 a	0.957±0.152 a	0.0338±0.0172 a	0.474±0.150 a	0.00702±0.00217 a	N.D.
	4SS+0.5N	44.5±4.80 a	4.73±1.46 a	2.29±0.00622 a	1.26±0.181 a	0.0358±0.0123 a	0.378±0.102 a	0.00802±0.00156 a	N.D.
	1CD+0.5N	25.6±5.85 b	4.87±2.39 a	1.92±0.339 a	1.69±0.662 a	0.0165±0.00704 a	0.381±0.151 a	0.00578±0.00155 a	N.D.
	GB2762-2017	—	—	—	1	0.1	0.2	0.5	0.02

[1)] Eight treatments: three with SS-unamended soil (CK, blank control; 0.5N, 30.0 kg ha^{-1} urea; 1N, 60.0 kg ha^{-1} urea), four with different SSA rates (0.5SS+0.5N, 1SS+0.5N, 2SS+0.5N and 4SS+0.5N: 4.5, 9.0, 18.0 and 36.0 t ha^{-1}, respectively) and one with an addition of chicken dung (1CD+0.5N, 90.0 t ha^{-1}).

Data followed by the same letter(s) within each row are not significantly different at $P<0.05$ by the least significant difference test.

N.D.: Data not detectable or not available.

GB2762-2017: Food safety standards of China.

Appendix H. The contents of heavy metals in wheat straw in 2016 (Mean ± SE)

Treatments[1)]	Heavy metal (mg kg^{-1})							
	Zn	Cu	Cr	Ni	Cd	Pb	As	Hg
CK	14.6±4.38 a	3.56±0.404 b	2.00±0.00636 a	0.471±0.0529 b	0.0211±0.00162 bc	0.448±0.0198 b	0.0738±0.00451 c	0.00144±0.0000967 a
0.5N	13.4±4.55 a	6.87±0.903 ab	2.23±0.187 a	0.690±0.0710 b	0.0196±0.00141 c	0.560±0.0540 b	0.0856±0.00705 ab	0.00141±0.0000846 ab
1N	15.9±2.56 ab	7.42±0.653 a	2.13±0.149 a	0.656±0.361 b	0.0306±0.000915 a	0.500±0.0421 b	0.0932±0.00295 a	0.00133±0.000126 abc
0.5SS+0.5N	17.0±0.892 ab	5.40±0.433 b	1.91±0.293 a	0.579±0.0977 a	0.0196±0.00176 c	0.444±0.0200 b	0.0638±0.00177 c	0.00108±0.0000383 d
1SS+0.5N	15.7±0.787 ab	5.10±1.09 b	2.10±0.272 a	0.716±0.177 b	0.0212±0.00115 bc	0.516±0.0142 b	0.0833±0.00241 ab	0.00116±0.0000396 cd
2SS+0.5N	19.3±1.25 ab	4.13±2.53 b	2.22±0.134 a	0.690±0.114 b	0.0152±0.000750 c	0.453±0.0755 b	0.0947±0.000969 a	0.00113±0.0000500 cd
4SS+0.5N	24.6±2.35 a	3.20±0.618 b	2.34±0.0909 a	0.977±0.108 b	0.0210±0.000773 bc	0.549±0.0271 b	0.0834±0.00683 ab	0.00121±0.00000891 bcd
1CD+0.5N	20.8±2.09 ab	2.05±0.159 b	2.11±0.285 a	1.23±0.176 b	0.0274±0.00291 ab	0.764±0.0884 a	0.0869±0.0116 ab	0.00123±0.0000162 abcd
GB2762-2017	—	—	—	1	0.1	0.2	0.5	0.02

[1)] Eight treatments: three with SS-unamended soil (CK, blank control; 0.5N, 30.0 kg ha^{-1} urea; 1N, 60.0 kg ha^{-1} urea), four with different SSA rates (0.5SS+0.5N, 1SS+0.5N, 2SS+0.5N and 4SS+0.5N: 4.5, 9.0, 18.0 and 36.0 t ha^{-1}, respectively) and one with an addition of chicken dung (1CD+0.5N, 90.0 t ha^{-1}).

Data followed by the same letter(s) within each row are not significantly different at $P<0.05$ by the least significant difference test.

GB2762-2017: Food safety standards of China.

Appendix I. The contents of heavy metals in maize straw in 2013 (Mean ± SE)

Treatments[1)]	Heavy metal (mg kg^{-1})						
	Zn	Cu	Cr	Ni	Cd	Pb	As
CK	35.0±1.57 b	4.65±0.292 a	3.07±1.17 b	0.483±0.227 a	0.0378±0.00300 ab	0.617±0.0627 a	0.00736±0.00120 b
0.5N	24.14±1.62 c	3.58±1.10 ab	6.80±2.30 a	0.363±0.245 a	0.0326±0.00253 ab	1.03±0.537 a	0.00822±0.000772 b
1N	26.5±5.45 c	4.67±0.499 a	6.66±2.50 a	0.217±0.164 a	0.0803±0.0302 a	3.93±2.79 a	0.00707±0.000959 b
0.5SS+0.5N	34.6±2.26 b	2.89±0.282 b	8.35±1.81 a	0.0560±0.00529 a	0.0286±0.00504 b	0.646±0.113 a	0.00860±0.000537 ab
1SS+0.5N	45.0±1.26 a	4.01±0.553 ab	8.60±0.971 a	0.0799±0.0150 a	0.0454±0.0104 ab	1.44±0.682 a	0.0147±0.00565 ab
2SS+0.5N	36.4±2.74 b	3.79±0.431 ab	4.40±2.64 b	0.393±0.176 a	0.0531±0.0182 ab	1.74±0.638 a	0.0105±0.00128 ab
4SS+0.5N	42.6±2.02 a	4.44±0.0767 ab	1.74±0.00701 b	0.531±0.00775 a	0.0309±0.00157 ab	0.556±0.0144 a	0.0183±0.00566 a
1CD+0.5N	35.0±9.37 a	4.11±0.299 ab	4.36±2.32 b	0.402±0.154 a	0.0635±0.0213 ab	8.30±6.16 a	0.00849±0.00177 ab
GB2762-2017	—	—	—	1	0.1	0.2	0.5

[1)] Eight treatments: three with SS-unamended soil (CK, blank control; 0.5N, 30.0 kg ha^{-1} urea; 1N, 60.0 kg ha^{-1} urea), four with different SSA rates (0.5SS+0.5N, 1SS+0.5N, 2SS+0.5N and 4SS+0.5N: 4.5, 9.0, 18.0 and 36.0 t ha^{-1}, respectively) and one with an addition of chicken dung (1CD+0.5N, 90.0 t ha^{-1}).

Data followed by the same letter(s) within each row are not significantly different at $P<0.05$ by the least significant difference test.

GB2762-2017: Food safety standards of China.

Appendix J. Bioaccumulation factors of heavy metals (Zn, Cu, Cr, Ni, Cd, Pb, As, Hg) in plant grain and straw under the control (CK), sewage sludge (SS), and chicken dung (CD) treatments

Year	Crop	Treatments[1)]	Heavy metal (mg kg^{-1})															
			Zn		Cu		Cr		Ni		Cd		Pb		As		Hg	
			grain	straw	grain	straw	grain	straw	grain	straw	grain	straw	grain	straw	grain	straw	grain	straw
2016	Wheat	CK	0.426	0.216	0.221	0.234	0.0174	0.0310	0.0837	0.0321	0.0346	0.0521	0.00376	0.00883	0.00613	0.00869	0.445	0.0693
		0.5N	0.393	0.179	0.110	0.419	0.0102	0.0336	0.0205	0.0311	0.0246	0.0557	0.00381	0.0124	0.00485	0.00863	0.298	0.0525
		1N	0.479	0.239	0.108	0.412	0.0133	0.0330	0.0265	0.0245	0.0208	0.0897	0.00230	0.0128	0.00541	0.0102	0.372	0.0589
		0.5SS+0.5N	0.266	0.185	0.0895	0.264	0.00856	0.0289	0.0270	0.0205	0.0251	0.0617	0.00308	0.0122	0.00919	0.00698	0.162	0.0227
		1SS+0.5N	0.253	0.149	N.D.	0.227	0.0101	0.0325	0.0174	0.0246	0.0253	0.0905	0.00329	0.0156	0.00393	0.00981	0.173	0.0258
		2SS+0.5N	0.240	0.144	0.0915	0.158	0.0181	0.0345	0.0214	0.0251	0.0155	0.0603	0.00312	0.0136	0.00203	0.0102	0.171	0.0233
		4SS+0.5N	0.223	0.127	0.0372	0.0932	0.00838	0.0355	0.0223	0.0348	0.0181	0.0770	0.00300	0.0159	0.00166	0.00773	0.270	0.0388
		1CD+0.5N	0.405	0.259	N.D.	0.115	0.0105	0.0331	0.0213	0.0504	0.0252	0.174	0.00542	0.0340	0.00308	0.0110	0.312	0.0439
2013	Maize	CK	0.505	0.755	0.118	0.220	0.0210	0.0365	0.00328	0.0266	0.0916	0.293	0.0151	0.0296	0.00103	0.00169	N.D.[a)]	N.D.
		0.5N	0.645	0.605	0.147	0.175	0.0323	0.115	0.00602	0.0256	0.227	0.268	0.0124	0.0470	0.00264	0.00295	N.D.	N.D.
		1N	0.728	0.735	0.243	0.238	0.0356	0.105	0.00874	0.0155	0.233	0.703	0.0113	0.181	0.00370	0.00240	N.D.	N.D.
		0.5SS+0.5N	0.588	0.624	0.187	0.125	0.0330	0.118	0.00443	0.0040	0.261	0.200	0.0178	0.0277	0.00107	0.00129	N.D.	N.D.
		1SS+0.5N	0.518	0.704	0.0940	0.163	0.0413	0.133	0.00684	0.0059	0.298	0.340	0.0147	0.0631	0.00272	0.00475	N.D.	N.D.
		2SS+0.5N	0.153	0.185	0.152	0.122	0.0266	0.0672	0.00703	0.0289	0.192	0.301	0.0191	0.0702	0.00302	0.00452	N.D.	N.D.
		4SS+0.5N	0.258	0.246	0.104	0.0975	0.0338	0.0257	0.00915	0.0386	0.147	0.127	0.0119	0.0176	0.00242	0.00551	N.D.	N.D.
		1CD+0.5N	0.447	0.610	0.228	0.193	0.0217	0.0494	0.0103	0.0244	0.0137	0.0526	0.0139	0.3033	0.00155	0.00228	N.D.	N.D.

[1)] Eight treatments: three with SS-unamended soil (CK, blank control; 0.5N, 30.0 kg ha^{-1} urea; 1N, 60.0 kg ha^{-1} urea), four with different SSA rates (0.5SS+0.5N, 1SS+0.5N, 2SS+0.5N and 4SS+0.5N: 4.5, 9.0, 18.0 and 36.0 t ha^{-1}, respectively) and one with an addition of chicken dung (1CD+0.5N, 90.0 t ha^{-1}).

N.D.: Data not detectable or not available.

Appendix K. The BCFs of heavy metals in wheat and maize grains from 2007 to 2016 (except for 2015)

Year	Treatments[1)]	Heavy metal (mg kg^{-1})															
		Zn		Cu		Cr		Ni		Cd		Pb		As		Hg	
		Wheat	Maize	Wheat	Maize	Wheat	Maize	Wheat	Maize	Wheat	Maize	Wheat	Maize	Wheat	Maize	Wheat	Maize
2007	CK	0.429	0.401	0.259	0.0854	0.0123	0.00255	0.0128	0.00547	0.202	0.0137	0.0125	0.00827	0.00594	0.000396	0.167	0.0300
	0.5N	0.489	0.406	0.280	0.0904	0.00946	0.00186	0.00614	0.00505	0.234	0.0432	0.00891	0.0111	0.00577	0.000769	0.118	0.0318
	1N	0.554	0.394	0.322	0.102	0.00782	0.00229	0.00400	0.00500	0.281	0.0605	0.00876	0.00920	0.00583	0.000971	0.0857	0.0150
	0.5SS+0.5N	0.587	0.405	0.294	0.105	0.00685	0.00518	0.00313	0.00344	0.216	N.D.	0.00849	0.00585	0.00673	0.000673	0.0867	0.0153
	1SS+0.5N	0.585	0.381	0.318	0.0910	0.0147	0.00737	0.00353	0.00565	0.182	0.0536	0.00769	0.0209	0.00577	0.000865	0.0478	0.00870
	2SS+0.5N	0.497	0.303	0.289	0.0759	0.0168	0.00771	0.00414	0.00226	0.203	0.0627	0.00957	0.0130	0.00648	0.000833	0.0220	0.00840
	4SS+0.5N	0.573	0.290	0.301	0.0745	0.0175	0.00545	0.00336	0.00224	0.200	0.0141	0.00940	N.D.[a)]	0.00631	0.000901	0.0161	0.00242
	1CD+0.5N	0.456	0.372	0.228	0.0898	0.0204	0.00813	0.00549	0.00353	0.146	0.0146	0.00990	N.D.	0.00849	0.00123	0.0714	0.0229
2008	CK	0.361	0.310	0.276	0.143	0.0116	0.00635	0.0279	0.0300	0.201	0.153	0.00793	0.00524	0.00258	0.000577	0.0450	0.0145
	0.5N	0.394	0.292	0.349	0.252	0.0222	0.00246	0.0136	0.0155	0.167	0.0794	0.00545	0.00642	0.00300	0.00148	0.101	0.00638
	1N	0.437	0.270	0.367	0.229	0.0427	0.00486	0.0355	0.0132	0.280	0.120	0.00485	0.00667	0.00389	0.000652	0.0669	0.0146
	0.5SS+0.5N	0.436	0.271	0.393	0.241	0.00628	0.00419	0.00910	0.0162	0.225	0.158	0.00570	0.00373	0.00311	0.00100	0.0500	0.0188
	1SS+0.5N	0.517	0.262	0.412	0.260	0.0152	0.00576	0.0231	0.0137	0.250	0.181	0.00503	0.00648	0.00281	0.000608	0.0767	0.0233
	2SS+0.5N	0.429	0.226	0.356	0.237	0.00847	0.0206	0.0926	0.278	0.350	0.171	0.00679	0.00630	0.00344	0.00101	0.0212	0.0131
	4SS+0.5N	0.327	0.161	0.271	0.162	0.00938	0.0177	0.0112	0.00715	0.219	0.0642	0.00671	0.00512	0.00386	0.000169	0.00786	0.00614
	1CD+0.5N	0.351	0.226	0.375	0.243	0.0119	0.00566	0.00755	0.0151	0.286	0.0317	0.00621	0.00460	0.00483	0.000601	0.0329	0.0207
2009	CK	0.391	0.378	0.288	0.0788	0.00957	0.0353	0.0185	0.00369	0.126	N.D.	0.0110	0.00677	0.00523	0.00225	0.00923	0.0485
	0.5N	0.397	0.357	0.309	0.104	0.0118	0.0313	0.00515	0.00523	0.102	N.D.	0.0175	0.00632	0.00719	0.00129	0.00781	0.0113
	1N	0.333	0.320	0.306	0.106	0.000682	0.0326	0.00482	0.00518	0.132	N.D.	0.00402	0.00336	0.00914	0.00244	0.0182	0.0156
	0.5SS+0.5N	0.479	0.365	0.312	0.104	0.00245	0.0170	0.00313	0.0131	0.0740	N.D.	0.00445	0.00521	0.00716	0.00308	0.00335	0.00429
	1SS+0.5N	0.476	0.279	0.229	0.0870	0.00732	0.0134	0.00290	0.0103	0.0734	N.D.	0.0124	0.0064	0.0117	0.00577	0.00360	0.00350
	2SS+0.5N	0.399	0.225	0.216	0.0717	0.00214	0.00435	0.00185	N.D.	0.0638	N.D.	0.00707	0.00337	0.00558	0.00208	0.00227	0.00157
	4SS+0.5N	0.271	0.154	0.149	0.0617	0.00948	0.00492	0.00310	N.D.	0.0510	N.D.	0.0136	0.00425	0.00361	0.00297	0.00102	0.00152
	1CD+0.5N	0.416	0.360	0.261	0.146	0.00560	0.0103	0.00398	0.00512	0.0551	N.D.	0.00578	0.00308	0.0160	0.00638	0.0151	0.0227

2010	CK	0.291	0.241	0.131	0.0797	0.00394	0.0177	0.00853	0.00694	0.0340	0.00213	N.D.	N.D.	0.00308	0.000583	0.0614	0.0474
	0.5N	0.338	0.291	0.185	0.101	0.0177	0.0207	0.00751	0.00680	0.0364	0.00944	N.D.	N.D.	0.00151	0.000400	0.0327	0.0318
	1N	0.500	0.448	0.257	0.133	0.00906	0.0252	0.0131	0.00548	0.0444	0.0138	N.D.	N.D.	0.00391	0.000457	0.0349	0.0244
	0.5SS+0.5N	0.425	0.242	0.190	0.103	0.00334	0.0197	0.00730	0.00536	0.0307	0.00102	N.D.	N.D.	0.00415	0.000798	0.0135	0.0115
	1SS+0.5N	0.424	0.244	0.156	0.108	0.00727	0.0136	0.00802	0.00347	0.0531	0.0104	N.D.	N.D.	0.00503	0.000302	0.00683	0.00488
	2SS+0.5N	0.365	0.238	0.133	0.0955	0.00357	0.0176	0.00442	0.00330	0.0210	0.0119	N.D.	N.D.	0.00377	0.000434	0.00478	0.00609
	4SS+0.5N	0.224	0.132	0.107	0.0748	0.00660	0.0245	0.00680	0.00585	0.0153	0.00736	N.D.	N.D.	0.00278	0.000348	0.00263	0.00152
	1CD+0.5N	0.286	0.309	0.195	0.219	0.00714	0.0152	0.00949	0.00585	0.0424	0.000909	N.D.	N.D.	0.00487	0.000731	0.0500	0.0593
2011	CK	0.365	0.231	0.212	0.0607	0.00440	0.00163	0.00519	0.00741		0.0139	0.00500	0.00169	0.00220	0.00116	0.0353	0.0182
	0.5N	0.431	0.243	0.270	0.0769	0.00485	0.00230	0.00667	0.00606	0.108	0.0100	0.00602	0.00125	0.00148	0.000571	0.0116	0.00632
	1N	0.531	0.225	0.285	0.108	0.00591	0.00171	0.00644	0.00455	0.143	0.00842	0.00632	0.00201	0.00327	0.00175	0.0210	0.0122
	0.5SS+0.5N	0.497	0.219	0.225	0.0735	0.00524	0.00157	0.00377	0.00491	0.0911	0.0474	0.00345	0.00211	0.00233	0.00123	0.00718	0.00235
	1SS+0.5N	0.521	0.222	0.227	0.0693	0.00573	0.00547	0.00712	0.00749	0.0724	0.00619	0.00609	0.00231	0.00323	0.000807	0.00259	0.00121
	2SS+0.5N	0.445	0.163	0.229	0.0455	0.00775	0.00604	0.00849	0.00701	0.0626	0.00696	0.00557	0.00169	0.00547	0.000965	0.000760	0.000450
	4SS+0.5N	0.348	0.118	0.161	0.0443	0.00511	0.00299	0.00369	0.00627	0.0563	0.00111	0.00506	0.00108	0.00944	0.00121	0.000667	0.000304
	1CD+0.5N	0.488	0.206	0.226	0.0561	0.00440	0.00239	0.00456	0.00342	0.0670	0.00200	0.00428	0.00110	0.00293	0.00230	0.0162	0.00489
2013	CK	0.405	N.D.	0.551	N.D.	0.00870	N.D.	0.0352	N.D.	0.0769	N.D.	0.00397	N.D.	0.00181	N.D.	N.D.	N.D.
	0.5N	0.490	N.D.	0.544	N.D.	0.00952	N.D.	0.0133	N.D.	0.0799	N.D.	0.00227	N.D.	0.00387	N.D.	N.D.	N.D.
	1N	0.620	N.D.	0.850	N.D.	0.00805	N.D.	0.0874	N.D.	0.0833	N.D.	0.00231	N.D.	0.00366	N.D.	N.D.	N.D.
	0.5SS+0.5N	0.455	N.D.	0.567	N.D.	0.00758	N.D.	0.0204	N.D.	0.0681	N.D.	0.00243	N.D.	0.00372	N.D.	N.D.	N.D.
	1SS+0.5N	0.484	N.D.	0.544	N.D.	0.0116	N.D.	0.0311	N.D.	0.0729	N.D.	0.00218	N.D.	0.00348	N.D.	N.D.	N.D.
	2SS+0.5N	0.298	N.D.	0.414	N.D.	0.0109	N.D.	0.104	N.D.	0.0550	N.D.	0.00201	N.D.	0.00031	N.D.	N.D.	N.D.
	4SS+0.5N	0.277	N.D.	0.309	N.D.	0.00858	N.D.	0.0145	N.D.	0.0399	N.D.	0.00158	N.D.	0.00325	N.D.	N.D.	N.D.
	1CD+0.5N	0.425	N.D.	0.580	N.D.	0.00848	N.D.	0.0258	N.D.	0.0625	N.D.	0.00292	N.D.	0.00641	N.D.	N.D.	N.D.
2014	CK	0.378	N.D.	0.459	N.D.	0.00636	N.D.	0.0215	N.D.	0.00833	N.D.	0.00337	N.D.	0.00105	N.D.	N.D.	N.D.
	0.5N	0.335	N.D.	0.539	N.D.	0.00729	N.D.	0.0210	N.D.	0.0532	N.D.	0.00413	N.D.	0.00112	N.D.	N.D.	N.D.
	1N	0.470	N.D.	0.613	N.D.	0.00617	N.D.	0.0154	N.D.	N.D.	N.D.	0.00375	N.D.	0.00119	N.D.	N.D.	N.D.
	0.5SS+0.5N	0.362	N.D.	0.459	N.D.	0.00742	N.D.	0.0164	N.D.	0.0478	N.D.	0.00496	N.D.	0.00117	N.D.	N.D.	N.D.
	1SS+0.5N	0.237	N.D.	0.398	N.D.	0.00615	N.D.	0.0233	N.D.	0.0387	N.D.	0.00286	N.D.	0.00101	N.D.	N.D.	N.D.

	2SS+0.5N	0.262	N.D.	0.254	N.D.	0.00819	N.D.	0.0208	N.D.	0.0308	N.D.	0.00303	N.D.	0.00113	N.D.	N.D.	N.D.
	4SS+0.5N	0.157	N.D.	0.281	N.D.	0.00622	N.D.	0.0259	N.D.	0.0263	N.D.	0.00227	N.D.	0.00150	N.D.	N.D.	N.D.
	1CD+0.5N	0.229	N.D.	0.451	N.D.	0.00690	N.D.	0.0117	N.D.	0.0625	N.D.	0.00357	N.D.	0.00252	N.D.	N.D.	N.D.
2016	CK	0.406	N.D.	0.209	N.D.	0.0137	N.D.	0.734	N.D.	0.0346	N.D.	0.00566	N.D.	0.109	N.D.	0.3875	N.D.
	0.5N	0.374	N.D.	0.104	N.D.	0.00792	N.D.	0.179	N.D.	0.0246	N.D.	0.00572	N.D.	0.0865	N.D.	0.2589	N.D.
	1N	0.456	N.D.	0.102	N.D.	0.0105	N.D.	0.232	N.D.	0.0208	N.D.	0.00350	N.D.	0.0957	N.D.	0.3231	N.D.
	0.5SS+0.5N	0.253	N.D.	0.0845	N.D.	0.00665	N.D.	0.237	N.D.	0.0251	N.D.	0.00457	N.D.	0.1641	N.D.	0.1413	N.D.
	1SS+0.5N	0.241	N.D.	N.D.	N.D.	0.00787	N.D.	0.153	N.D.	0.0253	N.D.	0.00503	N.D.	0.0695	N.D.	0.1509	N.D.
	2SS+0.5N	0.228	N.D.	0.0864	N.D.	0.0143	N.D.	0.188	N.D.	0.0155	N.D.	0.0209	N.D.	0.0365	N.D.	0.1482	N.D.
	4SS+0.5N	0.212	N.D.	0.0352	N.D.	0.00655	N.D.	0.196	N.D.	0.0181	N.D.	0.00438	N.D.	0.0298	N.D.	0.2353	N.D.
	1CD+0.5N	0.385	N.D.	N.D.	N.D.	0.00822	N.D.	1.03	N.D.	0.0252	N.D.	0.00810	N.D.	0.0544	N.D.	0.2702	N.D.
	Mean	0.398	0.279	0.303	0.117	0.00919	0.0109	0.0602	0.0146	0.100	0.0443	0.00619	0.00550	0.0139	0.00133	0.0686	0.0148

[1)] Eight treatments: three with SS-unamended soil (CK, blank control; 0.5N, 30.0 kg ha^{-1} urea; 1N, 60.0 kg ha^{-1} urea), four with different SSA rates (0.5SS+0.5N, 1SS+0.5N, 2SS+0.5N and 4SS+0.5N: 4.5, 9.0, 18.0 and 36.0 t ha^{-1}, respectively) and one with an addition of chicken dung (1CD+0.5N, 90.0 t ha^{-1}).

N.D.: Data not detectable or not available.