Supporting Information to:

Impact of land use and soil properties on soil methane flux response to biochar addition: a meta-analysis

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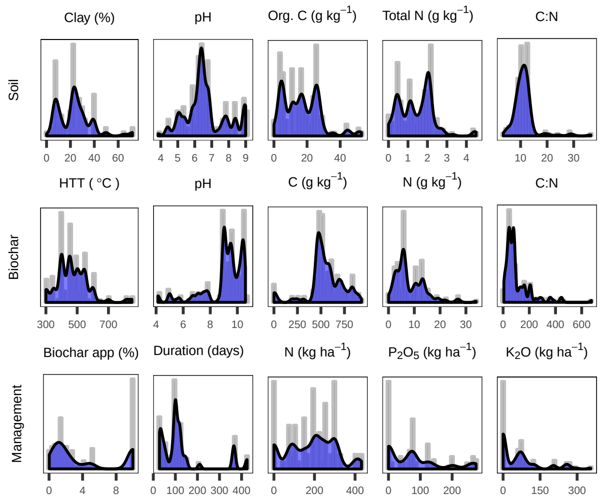

Figure S1. Kernel density plots of observed values for overall soil, biochar and management variables.

Table S1. Estimates from Bayesian mixed-effects meta-regression analysis (model 1) for the relationship between methane emission/uptake difference and intercept (Posterior mean of a parameter estimate, CI: 95% credible interval).

Fixed effects	Posterior mode	Posterior mean	Lower CI	Upper CI
Model1				
Intercept(meta-analytic mean)	-0.02	-0.01	-0.15	0.13
Random effects				
Study variance	0.08	0.13	0.03	0.28
Residual variance	0.0001	0.0003	0.0001	0.0008

Sample sizes at different levels are: 40 studies and 158 effect sizes (these are true for all the models we ran).

Table S2. Estimates from Bayesian mixed-effects meta-regression analysis (model 2) for the relationship between methane emission/uptake difference and intercept (Posterior mean of a parameter estimate, CI: 95% credible interval).

Fixed effects	Posterior mode	Posterior mean(SD)	Lower CI	Upper CI
Model2				
Water saturation				
upland	-0.02	-0.04	-0.2	0.1
paddy soil	0.07	0.05	-0.1	0.23
Random effects				
Study variance	0.12	0.16	0.03	0.35
Residual variance	0.0002	0.0003	0.0001	0.0007

Table S3. Estimates from Bayesian mixed-effects meta-regression analysis (model 3) for the relationship between methane emission/uptake difference and intercept (Posterior mean of a parameter estimate, CI: 95% credible interval)

Fixed effects	Posterior mode	Posterior mean(SD)	Lower CI	Upper CI
Model3				
texture				
coarse	-0.06	-0.09	-0.23	0.05
medium	-0.01	0.01	-0.11	0.16
fine	0.06	0.03	-0.12	0.16
Random effects				
Study variance	0.09	0.12	0.02	0.3
Residual variance	0.0002	0.003	0.00009	0.0006

Table S4. Estimates from Bayesian mixed-effects meta-regression analysis (model 4) for the relationship between methane emission/uptake difference and intercept (Posterior mean of a parameter estimate, CI: 95% credible interval).

Fixed effects	Posterior mode	Posterior mean(SD)	Lower CI	Upper CI
Model4				
SOC				
0-<10	-0.11	-0.08	-0.23	0.06
10-20	-0.12	-0.08	-0.23	0.07
>20	0.06	0.09	-0.05	0.25
Random effects				
Study variance	0.12	0.16	0.03	0.34
Residual variance	0.0002	0.0003	0.0001	0.0005

Table S5. Estimates from Bayesian mixed-effects meta-regression analysis (model 5) for the relationship between methane emission/uptake difference and intercept (Posterior mean of a parameter estimate, CI: 95% credible interval).

Fixed effects	Posterior mode	Posterior mean(SD)	Lower CI	Upper CI
Model5				
pH				
>8	-0.06	-0.04	-0.21	0.12
7-8	-0.05	-0.05	-0.22	0.12
6-<7	-0.02	-0.03	-0.21	0.12
<6	-0.02	0.01	-0.15	0.18
Random effects				
Study variance	0.11	0.14	0.03	0.32
Residual variance	0.0002	0.0004	0.0001	0.0009

Table S6. Estimates from Bayesian mixed-effects meta-regression analysis (model 6) for the relationship between methane emission/uptake difference and intercept (Posterior mean of a parameter estimate, CI: 95% credible interval).

Fixed effects	Posterior mode	Posterior mean(SD)	Lower CI	Upper CI
Model6				
TN				
>3	-0.06	-0.01	-0.61	0.53
1.5-3	0.004	0.01	-0.15	0.17
<1.5	-0.05	-0.05	-0.22	0.11
Random effects				
Study variance	0.11	0.16	0.04	0.38

Residual variance	0.0007	0.0009	0.0001	0.001

Table S7. Estimates from Bayesian mixed-effects meta-regression analysis (model 7) for the relationship between methane emission/uptake difference and intercept (Posterior mean of a parameter estimate, CI: 95% credible interval).

Fixed effects	Posterior mode	Posterior mean(SD)	Lower CI	Upper CI
Model7				
C/N				
>10	0.02	0.01	-0.11	0.16
7-<10	-0.03	-0.05	-0.19	0.08
<7	-0.51	-0.55	-1.26	0.11
Random effects				
Study variance	0.06	0.12	0.03	0.25
Residual variance	0.0005	0.0009	0.0001	0.001

Table S8. Estimates from Bayesian mixed-effects meta-regression analysis (model 8) for the relationship between methane emission/uptake difference and intercept (Posterior mean of a parameter estimate, CI: 95% credible interval).

Fixed effects	Posterior mode	Posterior mean(SD)	Lower CI	Upper CI
Model8				
Feedstocks				
Wood	0.005	0.004	-0.15	0.14
Herbaceous	0.005	0.02	-0.17	0.1
Biosolids	0.14	0.26	-0.69	1.48
Manures	-0.05	0.04	-0.21	0.11
Lignocellulosic	-0.01	0.03	-0.19	0.12

Random effects				
Study variance	0.08	0.14	0.03	0.33
Residual variance	0.003	0.0004	0.00009	0.0008

Table S9. Estimates from Bayesian mixed-effects meta-regression analysis (model 9) for the relationship between methane emission/uptake difference and intercept (Posterior mean of a parameter estimate, CI: 95% credible interval).

Fixed effects	Posterior mode	Posterior mean(SD)	Lower CI	Upper CI
Model9				
Biochar pH				
<7	-0.002	-0.02	-0.16	0.14
7-<8	-0.03	-0.03	-0.17	0.13
8-9	-0.03	-0.03	-0.17	0.12
>9	-0.009	-0.01	-0.01	0.13
Random effects				
Study variance	0.08	0.14	0.03	0.29
Residual variance	0.003	0.0004	0.0001	0.0008

Table S10. Estimates from Bayesian mixed-effects meta-regression analysis (model 10) for the relationship between methane emission/uptake difference and intercept (Posterior mean of a parameter estimate, CI: 95% credible interval).

Fixed effects	Posterior mode	Posterior mean(SD)	Lower CI	Upper CI
Model10				
Biochar temperature				
<400	-0.05	-0.03	-0.16	0.13

401-500	0.01	-0.002	-0.15	0.14
>500	-0.01	-0.014	-0.15	0.14
Random effects				
Study variance	0.08	0.14	0.03	0.31
Residual variance	0.0002	0.0004	0.0001	0.0008

Table S11. Estimates from Bayesian mixed-effects meta-regression analysis (model 11) for the relationship between methane emission/uptake difference and intercept (Posterior mean of a parameter estimate, CI: 95% credible interval).

Fixed effects	Posterior mode	Posterior mean(SD)	Lower CI	Upper CI
Model11				
Biochar C/N				
<50	-0.09	-0.03	-0.18	0.11
50-100	0.01	-0.02	-0.16	0.12
>100	-0.03	-0.002	-0.13	0.15
Random effects				
Study variance	0.08	0.13	0.03	0.3
Residual variance	0.0002	0.0004	0.0001	0.0008

Table S12. Estimates from Bayesian mixed-effects meta-regression analysis (model 12) for the relationship between methane emission/uptake difference and intercept (Posterior mean of a parameter estimate, CI: 95% credible interval).

Fixed effects	Posterior mode	Posterior mean(SD)	Lower CI	Upper CI
Model12				
Biochar App rate				

<1	0.10	0.06	-0.12	0.26
1-<2	-0.12	-0.08	-0.25	0.11
2-<5	-0.07	-0.07	-0.26	0.10
>5	0.11	0.07	-0.37	0.61
Random effects				
Study variance	0.13	0.2	0.05	0.44
Residual variance	0.0002	0.0003	0.0001	0.0008

Table S13. Estimates from Bayesian mixed-effects meta-regression analysis (model 13) for the relationship between methane emission/uptake difference and intercept (Posterior mean of a parameter estimate, CI: 95% credible interval).

Fixed effects	Posterior mode	Posterior mean(SD)	Lower CI	Upper CI
Model13				
Experimental method				
incubation	-0.08	-0.06	-0.34	0.2
pot	-0.02	-0.008	-0.23	0.25
field	-0.02	0.04	-0.19	0.32
Random effects				
Study variance	0.09	0.22	0.04	0.49
Residual variance	0.0002	0.0003	0.0001	0.0007

Table S14. Estimates from Bayesian mixed-effects meta-regression analysis (model 14) for the relationship between methane emission/uptake difference and intercept (Posterior mean of a parameter estimate, CI: 95% credible interval).

Fixed effects	Posterior mode	Posterior mean(SD)	Lower CI	Upper CI
Model14				
Experimental time				
<60	-0.13	-0.11	-0.42	0.13
60-150	0.02	0.02	-0.17	0.19
>150	0.05	0.02	-0.18	0.21
Random effects				
Study variance	0.11	0.15	0.04	0.32
Residual variance	0.0002	0.0003	0.00009	0.0008

Table S15. Estimates from Bayesian mixed-effects meta-regression analysis (model 15) for the relationship between methane emission/uptake difference and intercept (Posterior mean of a parameter estimate, CI: 95% credible interval).

Fixed effects	Posterior mode	Posterior mean(SD)	Lower CI	Upper CI
Model15				
Fertilizer N				
NO	-0.04	-0.02	-0.17	0.14
<150	-0.02	-0.02	-0.18	0.13
150-350	-0.02	-0.008	-0.15	0.15
>350	-0.02	-0.004	-0.17	0.15
Random effects				
Study variance	0.09	0.14	0.03	0.32
Residual variance	0.0002	0.0004	0.0001	0.0009

Table S16. Estimates from Bayesian mixed-effects meta-regression analysis (model 16) for the relationship between methane emission/uptake difference and intercept (Posterior mean of a parameter estimate, CI: 95% credible interval).

Fixed effects	Posterior mode	Posterior mean(SD)	Lower CI	Upper CI
Model16				
Fertilizer P2O5				
NO	-0.05	-0.04	-0.24	0.12
<150	-0.001	0.006	-0.21	0.22
>150	0.01	0.04	-0.19	0.24
Random effects				
Study variance	0.08	0.15	0.039	0.32
Residual variance	0.0002	0.0003	0.0001	0.0007

Table S17. Estimates from Bayesian mixed-effects meta-regression analysis (model 17) for the relationship between methane emission/uptake difference and intercept (Posterior mean of a parameter estimate, CI: 95% credible interval).

Fixed effects	Posterior mode	Posterior mean(SD)	Lower CI	Upper CI
Model17				
Fertilizer K2O				
NO	-0.07	-0.07	-0.25	0.11
<150	0.04	0.05	-0.16	0.24
>150	0.07	0.05	-0.16	0.26
Random effects				
Study variance	0.07	0.13	0.02	0.3
Residual variance	0.0002	0.0004	0.0001	0.0008

Table S18. Estimates from Bayesian mixed-effects meta-regression analysis (model 18) for the relationship between methane emission/uptake difference and intercept (Posterior mean of a parameter estimate, CI: 95% credible interval).

Fixed effects	Posterior mode	Posterior mean(SD)	Lower CI	Upper CI
Model18 Water saturation, soil pH, texture				
interaction				
Paddy coarse pH <6	0.49	0.56	-0.45	1.67
Paddy coarse pH 6-<7	0.15	0.09	-0.19	0.35
Paddy coarse pH 7-8	-2.43	-2.67	-4.28	-1
Paddy fine pH <6	0.18	0.12	-0.17	0.44
Paddy fine pH 6-<7	0.53	0.55	-1.19	2.19
Paddy medium pH <6	-0.02	-0.07	-0.48	0.35
Paddy medium pH 6-<7	-0.28	-0.23	-0.86	0.36
Paddy medium pH 7-8	0.02	-0.03	-0.43	0.33
upland coarse pH <6	-0.18	-0.11	-0.56	0.29
upland coarse pH 6-<7	-0.22	-0.26	-0.5	0.01
upland coarse pH 7-8	0.003	-0.008	-0.27	0.24
upland coarse pH >8	0.04	-0.01	-0.48	0.43
upland fine pH <6	0.05	0.007	-0.25	0.27
upland fine pH 6-<7	-0.07	-0.1	-0.57	0.35
upland medium pH <6	-0.03	-0.06	-0.42	0.44
upland medium pH 6-<7	-0.006	-0.03	-0.32	0.18
upland medium pH 7-8	0.06	-0.01	-0.31	0.25
upland medium pH >8	0.004	-0.03	-0.28	0.21
Random effects				
Study variance	0.14	0.23	0.03	0.51

Residual variance	0.0002	0.0003	0.0001	0.0005

Table S19. Estimates from Bayesian mixed-effects meta-regression analysis (model 19) for the relationship between methane emission/uptake difference and intercept (Posterior mean of a parameter estimate, CI: 95% credible interval).

Fixed effects	Posterior mode	Posterior mean(SD)	Lower CI	Upper CI
Model19 Water saturation, SOC, texture		0.09	0.006	0.3
interaction				
Paddy coarse SOC 0-<10	1.17	1.16	-0.18	2.42
Paddy coarse SOC 10-20	-0.62	-0.45	-0.99	0.24
Paddy coarse SOC >20	0.11	0.11	-0.08	0.35
Paddy fine SOC 0-<10	0.14	0.44	-0.94	1.94
Paddy fine SOC 10-20	0.13	0.12	-0.11	0.33
Paddy fine SOC >20	0.28	0.28	-0.59	1.38
Paddy medium SOC 0-<10	-0.07	-0.05	-0.33	0.21
Paddy medium SOC 10-20	-0.05	-0.06	-0.31	0.21
Paddy medium SOC >20	-0.09	0.08	-1.17	1.52
upland coarse SOC 0-<10	-0.005	0.001	-0.17	0.18
upland coarse SOC 10-20	-0.26	-0.26	-0.44	-0.07
upland coarse SOC >20	-0.05	-0.03	-0.33	0.18
upland fine SOC 0-<10	0.05	0.02	-0.15	0.21
upland fine SOC 10-20	0.24	0.12	-0.49	0.82
Upland fine SOC >20	-0.03	-0.03	-0.31	0.21
upland medium SOC 0-<10	-0.04	-0.01	-0.2	0.14
upland medium SOC 10-20	-0.003	-0.02	-0.2	0.14

upland medium SOC >20	-0.04	-0.03	-0.22	0.14
Random effects				
Study variance	0.03	0.1	0.002	0.32
Residual variance	0.0002	0.0003	0.00009	0.0005

Table S20. Estimates of the summary effect and the standard error from Bayesian mixed-effects meta-regression analysis (model 1) and traditional random-effect meta-analysis (CI: 95% credible interval) for the coarse-texture soil.

Model	Summary mean effects	Lower CI	Upper CI	Standard error
Model1	-0.022	-0.585	0.714	1.006
Traditional meta-analysis	-0.08	-0.14	-0.02	0.06

Datasets S1. The original data extracted from the individual studies for meta-anlaysis

reference	Land use	Analytical m	days	Soil texture	Soil pH	Biochar pH
Aguilar-Chávez	upland	pot	<60	coarse	>8	8-9
Aguilar-Chávez	upland	pot	<60	coarse	>8	8-9
Aguilar-Chávez	upland	pot	<60	coarse	>8	8-9
Ali et al.2013	paddy soil	incubation	60-150	medium	6-<7	8-9
Ali et al.2013	paddy soil	incubation	60-150	medium	6-<7	8-9
Angst et al,201	upland	pot	>150	coarse	7-8	7-<8
Angst et al,201	upland	pot	>150	coarse	7-8	7-<8
Barbosa de Sou	paddy soil	field	>150	fine	6-<7	>9
Barbosa de Sou	paddy soil	field	>150	fine	6-<7	>9
Bian et al,2014	paddy soil	field	>150	fine	<6	8-9
Borchard et al,2	upland	incubation	60-150	medium	6-<7	7-<8
Borchard et al,2	upland	incubation	60-150	medium	6-<7	>9
Díaz-Rojas et a	upland	pot	<60	coarse	>8	8-9
Díaz-Rojas et a	upland	pot	<60	coarse	>8	8-9
Feng et al, 201	paddy soil	pot	60-150	coarse	7-8	>9
Feng et al, 201	paddy soil	pot	60-150	coarse	7-8	>9
Feng et al, 201	paddy soil	pot	60-150	coarse	7-8	>9
Feng et al, 201	paddy soil	pot	60-150	medium	<6	>9
Feng et al, 201	paddy soil	pot	60-150	medium	<6	>9
Feng et al, 201	paddy soil	pot	60-150	medium	<6	>9
Fungo et al, 2(	upland	pot	<60	medium	6-<7	>9
Fungo et al, 2(	upland	pot	<60	medium	6-<7	>9
Fungo et al, 2(	upland	pot	<60	medium	6-<7	>9
Fungo et al, 2(	upland	pot	<60	medium	6-<7	>9
Fungo et al, 2(	upland	pot	<60	medium	6-<7	7-<8
Fungo et al, 2(	upland	pot	<60	medium	6-<7	7-<8
Fungo et al, 2(	upland	pot	<60	medium	6-<7	>9
Fungo et al, 2(	upland	pot	<60	medium	6-<7	>9
Jia et al, 2012	upland	pot	60-150	medium	<6	>9
Jia et al, 2012	upland	pot	60-150	medium	<6	>9
Jia et al, 2012	upland	pot	60-150	medium	<6	>9
Jia et al, 2012	upland	pot	60-150	medium	<6	>9
Kang et al. 201(	upland	pot	60-150	medium	6-<7	7-<8
Kang et al. 201(	upland	pot	60-150	medium	6-<7	7-<8
Kang et al. 201(	upland	pot	60-150	medium	6-<7	7-<8
Kang et al. 201(	paddy soil	field	60-150	medium	<6	>9
Kang et al. 201(	paddy soil	field	60-150	medium	6-<7	>9
Li et al, 2015	upland	field	>150	fine	<6	>9
Li et al, 2015	upland	field	>150	fine	<6	>9
Li et al, 2015	upland	field	>150	fine	<6	>9
Li et al, 2015	upland	field	>150	fine	<6	>9
Li et al, 2015	upland	field	>150	fine	<6	>9
Li et al, 2015	upland	field	>150	fine	<6	>9
Li Feiyue et al,2	upland	incubation	<60	fine	<6	>9

Li Feiyue et al,2	upland	incubation	<60	fine	<6	>9
Li Feiyue et al,2	upland	incubation	<60	medium	>8	>9
Li Feiyue et al,2	upland	incubation	<60	medium	>8	>9
Li Feiyue et al,2	upland	incubation	<60	coarse	7-8	>9
Li Feiyue et al,2	upland	incubation	<60	coarse	7-8	>9
Li Feiyue et al,2	upland	incubation	<60	medium	6-<7	>9
Li Feiyue et al,2	upland	incubation	<60	medium	6-<7	>9
Li Feiyue et al,2	upland	incubation	<60	medium	7-8	>9
Li Feiyue et al,2	upland	incubation	<60	medium	7-8	>9
Lin et al. 2015	upland	pot	60-150	coarse	>8	>9
Lin et al. 2015	upland	pot	60-150	coarse	>8	>9
Lin et al. 2015	upland	pot	60-150	coarse	>8	>9
Lin et al. 2015	upland	pot	>150	coarse	>8	>9
Lin et al. 2015	upland	pot	>150	coarse	>8	>9
Lin et al. 2015	upland	pot	>150	coarse	>8	>9
LIU et al， 2015	paddy soil	field	60-150	coarse	6-<7	>9
Liuqian Yu,2013	paddy soil	incubation	60-150	medium	<6	>9
Liuqian Yu,2013	upland	incubation	60-150	medium	<6	>9
Yuxue Liu,2011	paddy soil	incubation	<60	coarse	<6	>9
Yuxue Liu,2011	paddy soil	incubation	<60	coarse	<6	>9
Yuxue Liu,2011	paddy soil	incubation	<60	coarse	<6	>9
Yuxue Liu,2011	paddy soil	incubation	<60	coarse	<6	>9
Yuxue Liu,2011	paddy soil	incubation	<60	coarse	<6	>9
Yuxue Liu,2011	paddy soil	incubation	<60	coarse	<6	>9
Ly Proyuth,2014	paddy soil	pot	60-150	coarse	<6	8-9
Malghani et al,2	upland	incubation	60-150	fine	6-<7	<7
Malghani et al,2	upland	incubation	60-150	coarse	<6	<7
Malghani et al,2	upland	incubation	60-150	medium	6-<7	>9
Malghani et al,2	upland	incubation	60-150	medium	6-<7	<7
Mukherjee et al	upland	field	60-150	fine	6-<7	>9
Nguyen et al,20	upland	incubation	60-150	fine	<6	8-9
Nguyen et al,20	upland	incubation	60-150	fine	<6	8-9
Schimmelpfenn	upland	field	60-150	medium	<6	>9
Scheer et al,201	upland	field	<60	fine	<6	<7
Shen et al， 201	paddy soil	field	60-150	fine	<6	>9
Shen et al， 201	paddy soil	field	60-150	fine	<6	>9
Singla et al,2014	paddy soil	pot	60-150	coarse	<6	8-9
Spokas et al,(20	upland	incubation	60-150	medium	6-<7	7-<8
Spokas et al,(20	upland	incubation	60-150	medium	6-<7	<7
Spokas et al,(20	upland	incubation	60-150	medium	6-<7	>9
Spokas et al,(20	upland	incubation	60-150	medium	6-<7	<7
Spokas et al,(20	upland	incubation	60-150	medium	6-<7	7-<8
Spokas et al,(20	upland	incubation	60-150	medium	6-<7	<7
Spokas et al,(20	upland	incubation	60-150	medium	6-<7	8-9
Spokas et al,(20	upland	incubation	60-150	medium	6-<7	8-9

Spokas et al,(20	upland	incubation	60-150	medium	6-<7	<7
Spokas et al,(20	upland	incubation	60-150	medium	6-<7	8-9
Spokas et al,(20	upland	incubation	60-150	medium	6-<7	8-9
Spokas et al,(20	upland	incubation	60-150	medium	6-<7	7-<8
Spokas et al,(20	upland	incubation	60-150	medium	6-<7	>9
Spokas et al,(20	upland	incubation	60-150	medium	6-<7	8-9
Spokas et al,(20	upland	incubation	60-150	medium	6-<7	<7
Spokas et al,(20	upland	incubation	60-150	medium	6-<7	8-9
Spokas et al,(20	upland	incubation	60-150	medium	6-<7	8-9
Spokas et al,(20	upland	incubation	60-150	medium	6-<7	8-9
Spokas et al,(20	upland	incubation	60-150	medium	6-<7	8-9
Spokas et al,(20	upland	incubation	60-150	coarse	6-<7	8-9
Spokas et al,(20	upland	incubation	60-150	coarse	6-<7	8-9
Spokas et al,(20	upland	incubation	60-150	coarse	6-<7	<7
Spokas et al,(20	upland	incubation	60-150	coarse	6-<7	8-9
Spokas et al,(20	upland	incubation	60-150	coarse	6-<7	8-9
Spokas et al,(20	upland	incubation	60-150	coarse	6-<7	7-<8
Spokas et al,(20	upland	incubation	60-150	coarse	6-<7	>9
Spokas et al,(20	upland	incubation	60-150	coarse	6-<7	8-9
Spokas et al,(20	upland	incubation	60-150	coarse	6-<7	<7
Spokas et al,(20	upland	incubation	60-150	coarse	6-<7	8-9
Spokas et al,(20	upland	incubation	60-150	coarse	6-<7	8-9
Spokas et al,(20	upland	incubation	60-150	coarse	6-<7	8-9
Spokas et al,(20	upland	incubation	60-150	coarse	6-<7	8-9
Troy et al,2013	upland	pot	<60	medium	6-<7	>9
Troy et al,2013	upland	pot	<60	medium	6-<7	>9
Wang et al,201	paddy soil	pot	60-150	medium	6-<7	>9
Wang et al,201	paddy soil	pot	60-150	medium	6-<7	>9
Wang et al,201	paddy soil	pot	60-150	medium	6-<7	>9
Wang et al,201	paddy soil	pot	60-150	medium	6-<7	>9
Wu et al, 2014	upland	field	60-150	medium	7-8	8-9
Xie et al, 2013	paddy soil	pot	60-150	coarse	7-8	>9
Xie et al, 2013	paddy soil	pot	60-150	medium	<6	>9
Yoo et al,(2012,	upland	incubation	<60	medium	7-8	<7
Yoo et al,(2012,	upland	incubation	<60	medium	7-8	7-<8
Yoo et al,(2012,	paddy soil	incubation	<60	medium	7-8	<7
Yoo et al,(2012,	paddy soil	incubation	<60	medium	7-8	7-<8
Yoo et al,(2012,	paddy soil	incubation	<60	fine	<6	7-<8
Yoo et al,(2012,	paddy soil	incubation	<60	fine	<6	>9
Yoo et al,(2012,	paddy soil	incubation	<60	fine	<6	<7
Yoo et al,(2012,	paddy soil	incubation	<60	fine	<6	>9
Zhang et al,(20	paddy soil	field	>150	coarse	6-<7	>9
Zhang et al,(20	paddy soil	field	>150	coarse	6-<7	>9
Zhang et al,(20	paddy soil	field	>150	coarse	6-<7	>9
Zhang et al,(20	paddy soil	field	>150	coarse	6-<7	>9

Zhang et al,(20	paddy soil	field	>150	coarse	6-<7	>9
Zhang et al,(20	paddy soil	field	>150	coarse	6-<7	>9
Zhang et al,(20	upland	field	60-150	medium	>8	>9
Zhang et al,(20	upland	field	60-150	medium	>8	>9
Zhang et al,(20	upland	field	60-150	medium	>8	>9
Zhang et al,(20	upland	field	60-150	medium	>8	>9
Zhang et al,(20	paddy soil	field	60-150	coarse	6-<7	>9
Zhang et al,(20	paddy soil	field	60-150	coarse	6-<7	>9
Zhang et al,(20	paddy soil	field	60-150	coarse	6-<7	>9
Zhang et al,(20	paddy soil	field	60-150	coarse	6-<7	>9
Zhang dengxia	upland	field	>150	coarse	>8	>9
Zhang dengxia	upland	field	>150	coarse	>8	>9
Zhang dengxia	upland	field	>150	coarse	>8	>9
Zhang dengxia	upland	field	>150	coarse	>8	>9
Zhao et al,2014	paddy soil	pot	60-150	medium	6-<7	>9
Zhao et al,2014	paddy soil	pot	60-150	medium	6-<7	>9
Zheng et al,201	upland	incubation	60-150	medium	>8	>9
Zheng et al,201	upland	incubation	60-150	medium	>8	>9
Zheng et al,201	upland	incubation	60-150	medium	>8	>9
Zheng et al,201	upland	incubation	60-150	medium	>8	>9
Zheng et al,201	upland	incubation	60-150	medium	6-<7	>9
Zheng et al,201	upland	incubation	60-150	medium	6-<7	>9
Zheng et al,201	upland	incubation	60-150	medium	6-<7	>9
Zheng et al,201	upland	incubation	60-150	medium	6-<7	>9

HTTC	Feed stocks	Bio app ra	Bio C/N	Soil C/N	Soil N	SOC
<400	wood (oak, p	1-<2	>100	>10	1.5-3	>20
<400	wood (oak, p	2-<5	>100	>10	1.5-3	>20
<400	wood (oak, p	2-<5	>100	>10	1.5-3	>20
401-500	herbaceous	<1	50-100	>10	1.5-3	>20
401-500	herbaceous	<1	50-100	>10	1.5-3	>20
>500	wood (oak, p	<1	50-100	>10	>3	>20
>500	wood (oak, p	1-<2	50-100	>10	>3	>20
<400	lignocellulos	<1	>100	>10	<1.5	0-<10
<400	lignocellulos	<1	>100	>10	<1.5	0-<10
401-500	biowaste (m	2-<5	<50	>10	<1.5	>20
>500	wood (oak, p	>5	>100	7-<10	1.5-3	>20
>500	wood (oak, p	>5	>100	7-<10	1.5-3	>20
<400	wood (oak, p	2-<5	>100	>10	1.5-3	>20
<400	wood (oak, p	2-<5	>100	>10	1.5-3	>20
<400	herbaceous	1-<2	<50	<7	<1.5	0-<10
<400	herbaceous	1-<2	50-100	<7	<1.5	0-<10
401-500	herbaceous	1-<2	50-100	<7	<1.5	0-<10
<400	herbaceous	1-<2	<50	<7	<1.5	0-<10
<400	herbaceous	1-<2	50-100	<7	<1.5	0-<10
401-500	herbaceous	1-<2	50-100	<7	<1.5	0-<10
<400	herbaceous	1-<2	50-100	>10	<1.5	0-<10
<400	herbaceous	1-<2	50-100	>10	<1.5	0-<10
>500	herbaceous	1-<2	>100	>10	<1.5	0-<10
>500	herbaceous	1-<2	>100	>10	<1.5	0-<10
<400	wood (oak, p	1-<2	>100	>10	<1.5	0-<10
<400	wood (oak, p	1-<2	>100	>10	<1.5	0-<10
>500	wood (oak, p	1-<2	>100	>10	<1.5	0-<10
>500	wood (oak, p	1-<2	>100	>10	<1.5	0-<10
<400	herbaceous	1-<2	<50	7-<10	1.5-3	10-20
<400	herbaceous	2-<5	<50	7-<10	1.5-3	10-20
<400	herbaceous	1-<2	<50	7-<10	1.5-3	10-20
<400	herbaceous	1-<2	<50	7-<10	1.5-3	10-20
<400	herbaceous	<1	50-100	>10	<1.5	10-20
<400	herbaceous	<1	50-100	>10	<1.5	10-20
<400	herbaceous	<1	50-100	>10	<1.5	10-20
<400	herbaceous	<1	50-100	<10	<1.5	0-<10
<400	herbaceous	<1	50-100	<10	<1.5	10-20
<400	herbaceous	1-<2	50-100	7-<10	1.5-3	10-20
<400	herbaceous	1-<2	50-100	7-<10	1.5-3	10-20
<400	herbaceous	1-<2	50-100	7-<10	1.5-3	10-20
<400	herbaceous	2-<5	50-100	7-<10	1.5-3	10-20
<400	herbaceous	2-<5	50-100	7-<10	1.5-3	10-20
<400	herbaceous	2-<5	50-100	7-<10	1.5-3	10-20
<400	herbaceous	2-<5	<50	>10	<1.5	0-<10

401-500	herbaceous	2-<5	<50	>10	<1.5	0-<10
<400	herbaceous	2-<5	<50	>10	<1.5	0-<10
401-500	herbaceous	2-<5	<50	>10	<1.5	0-<10
<400	herbaceous	2-<5	<50	>10	<1.5	0-<10
401-500	herbaceous	2-<5	<50	>10	<1.5	0-<10
<400	herbaceous	2-<5	<50	>10	1.5-3	>20
401-500	herbaceous	2-<5	<50	>10	1.5-3	>20
<400	herbaceous	2-<5	<50	>10	<1.5	10-20
401-500	herbaceous	2-<5	<50	>10	<1.5	10-20
<400	herbaceous	<1	50-100	7-<10	<1.5	0-<10
<400	herbaceous	<1	50-100	7-<10	<1.5	0-<10
<400	herbaceous	1-<2	50-100	7-<10	<1.5	0-<10
<400	herbaceous	<1	50-100	7-<10	<1.5	0-<10
<400	herbaceous	<1	50-100	7-<10	<1.5	0-<10
<400	herbaceous	1-<2	50-100	7-<10	<1.5	0-<10
<400	herbaceous	<1	<50	7-<10	1.5-3	10-20
>500	manures or	>5	<50	>10	<1.5	10-20
>500	manures or	>5	<50	>10	<1.5	>20
>500	wood (oak,	<1	>100	>10	1.5-3	10-20
>500	wood (oak,	1-<2	>100	>10	1.5-3	10-20
>500	wood (oak,	2-<5	>100	>10	1.5-3	10-20
>500	herbaceous	<1	<50	>10	1.5-3	10-20
>500	herbaceous	1-<2	<50	>10	1.5-3	10-20
>500	herbaceous	2-<5	<50	>10	1.5-3	10-20
401-500	herbaceous	<1	<50	7-<10	<1.5	0-<10
401-500	herbaceous	1-<2	<50	>10	1.5-3	>20
401-500	herbaceous	1-<2	<50	>10	1.5-3	>20
401-500	herbaceous	1-<2	<50	>10	1.5-3	>20
401-500	herbaceous	1-<2	<50	>10	1.5-3	>20
>500	wood (oak,	<1	>100	>10	1.5-3	>20
401-500	herbaceous	2-<5	>100	>10	1.5-3	>20
401-500	herbaceous	1-<2	>100	>10	1.5-3	>20
>500	herbaceous	<1	>100	>10	1.5-3	>20
>500	manures or	<1	<50	7-<10	>3	>20
<400	herbaceous	<1	50-100	7-<10	1.5-3	10-20
<400	herbaceous	1-<2	50-100	7-<10	1.5-3	10-20
<400	herbaceous	<1	<50	>10	1.5-3	10-20
>500	wood (oak,	>5	>100	>10	1.5-3	>20
>500	wood (oak,	>5	>100	>10	1.5-3	>20
>500	wood (oak,	>5	>100	>10	1.5-3	>20
>500	wood (oak,	>5	>100	>10	1.5-3	>20
>500	lignocellulos	>5	>100	>10	1.5-3	>20
>500	lignocellulos	>5	>100	>10	1.5-3	>20
>500	herbaceous	>5	50-100	>10	1.5-3	>20
401-500	wood (oak,	>5	>100	>10	1.5-3	>20

401-500	lignocellulos	>5	<50	>10	1.5-3	>20
401-500	herbaceous	>5	<50	>10	1.5-3	>20
401-500	herbaceous	>5	<50	>10	1.5-3	>20
401-500	manures or	>5	<50	>10	1.5-3	>20
>500	manures or	>5	<50	>10	1.5-3	>20
401-500	wood (oak,	>5	>100	>10	1.5-3	>20
401-500	lignocellulos	>5	50-100	>10	1.5-3	>20
>500	herbaceous	>5	50-100	>10	1.5-3	>20
>500	herbaceous	>5	50-100	>10	1.5-3	>20
401-500	lignocellulos	>5	>100	>10	1.5-3	>20
>500	wood (oak,	>5	>100	>10	1.5-3	>20
>500	herbaceous	>5	50-100	7-<10	<1.5	10-20
401-500	wood (oak,	>5	>100	7-<10	<1.5	10-20
401-500	lignocellulos	>5	<50	7-<10	<1.5	10-20
401-500	herbaceous	>5	<50	7-<10	<1.5	10-20
401-500	herbaceous	>5	<50	7-<10	<1.5	10-20
401-500	manures or	>5	<50	7-<10	<1.5	10-20
>500	manures or	>5	<50	7-<10	<1.5	10-20
401-500	wood (oak,	>5	>100	7-<10	<1.5	10-20
401-500	lignocellulos	>5	50-100	7-<10	<1.5	10-20
>500	herbaceous	>5	50-100	7-<10	<1.5	10-20
>500	herbaceous	>5	50-100	7-<10	<1.5	10-20
401-500	lignocellulos	>5	>100	7-<10	<1.5	10-20
>500	wood (oak,	>5	>100	7-<10	<1.5	10-20
>500	manures or	<1	<50	>10	1.5-3	>20
>500	wood (oak,	<1	>100	>10	1.5-3	>20
401-500	herbaceous	1-<2	50-100	>10	<1.5	0-<10
401-500	herbaceous	2-<5	50-100	>10	<1.5	0-<10
401-500	herbaceous	1-<2	50-100	>10	<1.5	0-<10
401-500	herbaceous	2-<5	50-100	>10	<1.5	0-<10
<400	herbaceous	<1	>100	7-<10	<1.5	0-<10
<400	herbaceous	<1	<50	>10	1.5-3	10-20
<400	herbaceous	<1	<50	7-<10	<1.5	0-<10
<400	herbaceous	2-<5	<50	>10	<1.5	0-<10
>500	manures or	2-<5	<50	>10	<1.5	0-<10
<400	herbaceous	2-<5	<50	7-<10	<1.5	0-<10
>500	manures or	2-<5	<50	7-<10	<1.5	0-<10
<400	herbaceous	2-<5	<50	>10	1.5-3	10-20
>500	herbaceous	2-<5	50-100	>10	1.5-3	10-20
<400	herbaceous	2-<5	50-100	>10	1.5-3	10-20
>500	herbaceous	2-<5	50-100	>10	1.5-3	10-20
401-500	herbaceous	<1	50-100	>10	1.5-3	>20
401-500	herbaceous	1-<2	50-100	>10	1.5-3	>20
401-500	herbaceous	2-<5	50-100	>10	1.5-3	>20
401-500	herbaceous	<1	50-100	>10	1.5-3	>20

401-500	herbaceous	1-<2	50-100	>10	1.5-3	>20
401-500	herbaceous	2-<5	50-100	>10	1.5-3	>20
401-500	herbaceous	1-<2	50-100	>10	<1.5	10-20
401-500	herbaceous	1-<2	50-100	>10	<1.5	10-20
401-500	herbaceous	1-<2	50-100	>10	1.5-3	10-20
401-500	herbaceous	1-<2	50-100	>10	1.5-3	10-20
401-500	herbaceous	<1	50-100	>10	1.5-3	>20
401-500	herbaceous	2-<5	50-100	>10	1.5-3	>20
401-500	herbaceous	<1	50-100	>10	1.5-3	>20
401-500	herbaceous	2-<5	50-100	>10	1.5-3	>20
401-500	herbaceous	1-<2	50-100	7-<10	<1.5	0-<10
401-500	herbaceous	2-<5	50-100	7-<10	<1.5	0-<10
401-500	herbaceous	1-<2	50-100	7-<10	<1.5	0-<10
401-500	herbaceous	2-<5	50-100	7-<10	<1.5	0-<10
>500	herbaceous	<1	50-100	7-<10	1.5-3	10-20
>500	herbaceous	<1	50-100	7-<10	1.5-3	10-20
>500	wood (oak, p	>5	>100	7-<10	<1.5	0-<10
>500	wood (oak, p	>5	>100	7-<10	<1.5	0-<10
>500	wood (oak, p	>5	>100	7-<10	<1.5	0-<10
>500	wood (oak, p	>5	>100	7-<10	<1.5	0-<10
>500	wood (oak, p	>5	>100	>10	1.5-3	10-20
>500	wood (oak, p	>5	>100	>10	1.5-3	10-20
>500	wood (oak, p	>5	>100	>10	1.5-3	10-20
>500	wood (oak, p	>5	>100	>10	1.5-3	10-20

Fertilizer N	Fertilizer P2(	Fertilizer K2(	raw differen(	standard de	N
150	N	N	0.00077006	0.00381185	5
150	N	N	-0.0002449	0.00347066	5
150	N	N	-0.0017149	0.00279449	5
150	150	150	0.10463378	0.88806272	3
150	150	150	0.10463378	0.62140088	3
>350	150	>150	0.01598153	0.07218361	3
>350	150	>150	-0.0543377	0.09047439	3
150	150	150	-0.5707611	1.14406814	4
150-350	>150	>150	1.31542075	0.87134206	4
150-350	>150	>150	0.28329148	0.15935909	3
N	N	N	0.2648352	0.42728467	4
N	N	N	1.919813	0.92228314	4
150	N	N	-5.60E-06	0.00011636	3
150	N	N	-0.0000028	0.00011571	3
150-350	150	150	-4.0961748	4.67075977	3
150-350	150	150	-1.1279365	3.36435809	3
150-350	150	150	-4.630444	4.76059761	3
150-350	150	150	-2.6394424	2.68108533	3
150-350	150	150	0.14072442	1.58132623	3
150-350	150	150	-2.4606951	2.67682353	3
N	N	150	0.16382365	0.11297575	4
N	N	150	0.39370377	0.04365379	4
N	N	150	0.32500539	0.06184212	4
N	N	150	0.53110748	0.02851859	4
N	N	150	0.6288719	0.04728829	4
N	N	150	0.256307	0.08325991	4
N	N	150	0.56545321	0.03225298	4
N	N	150	0.27479978	0.07724055	4
>350	N	N	-0.0285714	0.03248321	3
>350	N	N	-0.0217687	0.01125365	3
150-350	N	N	-0.0302721	0.00515468	3
150-350	N	N	-0.0333333	0.00579896	3
150-350	>150	>150	-0.8970253	0.2933222	3
150-350	>150	>150	-0.9719968	0.25825374	3
150-350	>150	>150	-1.4219545	0.35345328	3
150	150	150	-0.1394231	0.2001233	3
150	150	150	-1.2668269	0.15808226	3
N	N	N	0.10179739	0.16259809	3
>350	>150	>150	0.17843137	0.08336868	3
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>350	>150	>150	0.12467321	0.07388157	3
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N	N	N	0.089638	0.00342984	3
N	N	N	-0.030922	0.0043231	3
N	N	N	-0.002693	0.00452759	3
N	N	N	-0.0274247	0.00285352	3
N	N	N	0.03954075	0.00349924	3
N	N	N	-0.0483978	0.01437311	3
N	N	N	0.02759975	0.01617232	3
N	N	N	-0.0382021	0.01600713	3
N	N	N	0.02381325	0.0223752	3
150	150	150	-0.0050593	0.0135353	3
150	150	150	0.01855081	0.0151231	3
150	150	150	0.01517783	0.01982298	3
150	150	150	-0.016262	0.01256157	3
150	150	150	0.00180637	0.01327771	3
150	150	150	0.0036142	0.01678115	3
150-350	150	150	-0.1700913	0.16859974	3
N	N	N	-0.0135173	0.00622449	9
N	N	N	-0.025597	0.01220702	9
N	N	N	-0.1157786	0.05767565	4
N	N	N	-0.5266125	0.04819409	4
N	N	N	-0.7843157	0.0282604	4
N	N	N	-0.698415	0.0295276	4
N	N	N	-1.348275	0.03174725	4
N	N	N	-1.3930929	0.02856726	4
150-350	>150	>150	2.85931297	0.52918769	3
N	N	N	0.04145656	0.0183444	4
N	N	N	0.0352796	0.0103686	4
N	N	N	-0.0440838	0.04098208	4
N	N	N	3.8598624	0.85428777	4
N	N	N	-0.2612039	0.52805597	3
150-350	N	N	0	0.00134769	6
150-350	N	N	-0.000107	0.00134769	6
150-350	N	N	-0.0182782	0.00604291	3
150-350	150	150	0.00059882	0.00017662	3
150-350	150	150	0.05786209	0.12658275	3
150-350	150	150	0.30861624	0.33370751	3
150	>150	150	3.86757426	0.61906967	3
N	N	N	0.18435921	0.0458171	3
N	N	N	-0.0355621	0.04220907	3
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