Supplementary Material

Effect of Oxytetracycline and Chlortetracycline on Bacterial Community Growth in Agricultural Soils

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Table S1. General characteristics of the studied soils (n=22).

Soil	pH_W	pH_{KCl}	C (%)	eCEC ($cmol_c$ kg^{-1})	DOC (mg kg^{-1})	Sand (%)	Silt (%)	Clay (%)
1	4.8	4.3	1.1	4.1	211	70	12	18
2	5.0	4.4	2.1	5.3	279	61	16	23
3	5.1	4.6	3.8	6.8	357	48	27	25
4	4.6	4.1	3.1	5.3	267	65	14	21
5	4.7	4.5	5.3	11.7	505	41	26	34
6	4.5	4.0	10.9	11.6	572	49	19	32
7	4.7	4.0	1.6	4.7	256	55	22	23
8	5.0	4.3	2.5	6.4	306	59	19	22
9	4.7	4.3	3.4	5.9	235	58	19	22
10	4.1	3.7	5.0	7.7	357	51	22	27
11	4.4	4.0	1.7	5.2	280	53	27	20
12	5.0	3.9	1.7	5.2	281	43	27	30
13	6.0	5.5	1.8	13.2	340	25	55	20
14	6.4	5.5	1.6	8.0	389	30	47	23
15	7.1	6.4	1.8	12.5	363	27	56	17
16	7.4	6.6	1.7	13.0	329	30	52	18
17	6.1	5.6	2.0	14.2	328	20	61	20
18	6.3	6.0	2.9	17.2	422	29	52	19
19	6.1	5.2	4.1	9.4	434	26	51	23
20	6.3	5.5	5.1	19.2	773	55	27	18
21	6.1	5.8	6.2	23.2	325	43	37	21
22	6.2	5.4	8.0	17.1	615	37	38	25

pH_W is pH measured in water; pH_{KCl} is pH measured in 0.1M KCl ; C is total carbon; eCEC is effective Cationic Exchange Capacity; DOC is dissolved organic carbon.

Table S2

Percentages of different oxytetracycline species for each pH measured in the whole set of studied soils (n=22).

			OTC			
Soil	**pH_w**	**pH**	**OTC^{+1}**	**OTC^{0}**	**OTC^{-1}**	**OTC^{-2}**
1	4.8	4.80	2.56	97.23	0.21	0.00
2	4.96	5.00	1.63	98.03	0.34	0.00
3	5.05	5.10	1.30	98.28	0.43	0.00
4	4.63	4.60	4.00	95.87	0.13	0.00
5	4.72	4.70	3.20	96.63	0.17	0.00
6	4.49	4.50	4.98	94.91	0.10	0.00
7	4.65	4.70	3.20	96.63	0.17	0.00
8	4.96	5.00	1.63	98.03	0.34	0.00
9	4.74	4.70	3.20	96.63	0.17	0.00
10	4.08	4.10	11.64	88.32	0.04	0.00
11	4.42	4.40	6.19	93.73	0.08	0.00
12	5.01	5.00	1.63	98.03	0.34	0.00
13	6.02	6.00	0.16	96.49	3.35	0.00
14	6.36	6.40	0.06	91.91	8.01	0.02
15	7.06	7.10	0.01	69.30	30.25	0.44
16	7.36	7.40	0.00	52.74	45.93	1.32
17	6.18	6.20	0.10	94.69	5.20	0.01
18	6.3	6.30	0.08	93.44	6.46	0.01
19	6.1	6.10	0.13	95.69	4.18	0.01
20	6.32	6.30	0.08	93.44	6.46	0.01
21	6.11	6.10	0.13	95.69	4.18	0.01
22	6.22	6.20	0.10	94.69	5.20	0.01

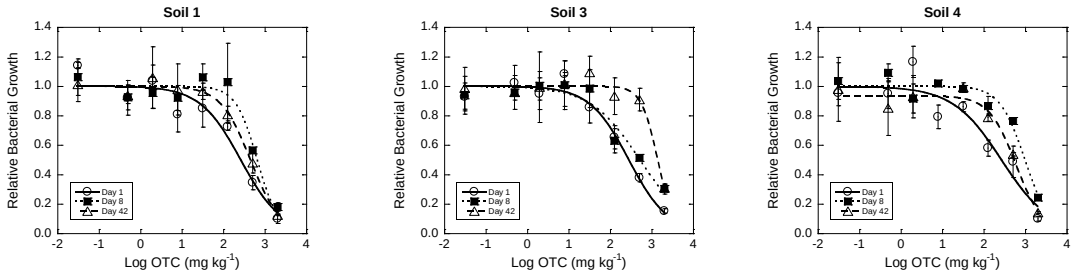
OTC: chlortetracycline. The superscript OTC^{X} is the valence of the antibiotic: positive (+), zwiterrionic (0) and negative (-) charge.

Table S3

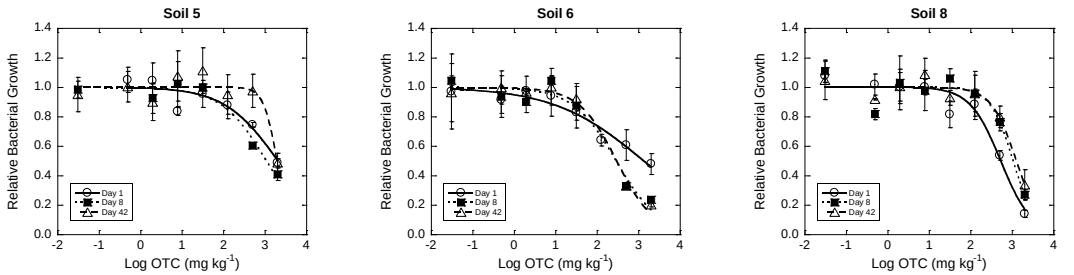
Percentages of different chlortetracycline species for each pH measured in the whole set of studied soils (n=22).

			CTC			
Soil	**pH_w**	**pH**	**CTC^{+1}**	**CTC^{0}**	**CTC^{-1}**	**CTC^{-2}**
1	4.8	4.80	3.06	96.84	0.10	0.00
2	4.96	5.00	1.95	97.89	0.16	0.00
3	5.05	5.10	1.56	98.25	0.20	0.00
4	4.63	4.60	4.77	95.17	0.06	0.00
5	4.72	4.70	3.83	96.10	0.08	0.00
6	4.49	4.50	5.93	94.02	0.05	0.00
7	4.65	4.70	3.83	96.10	0.08	0.00
8	4.96	5.00	1.95	97.89	0.16	0.00
9	4.74	4.70	3.83	96.10	0.08	0.00
10	4.08	4.10	13.68	86.30	0.02	0.00
11	4.42	4.40	7.36	92.61	0.04	0.00
12	5.01	5.00	1.95	97.89	0.16	0.00
13	6.02	6.00	0.20	98.25	1.56	0.00
14	6.36	6.40	0.08	96.10	3.83	0.00
15	7.06	7.10	0.01	83.31	16.62	0.05
16	7.36	7.40	0.01	71.39	28.42	0.18
17	6.18	6.20	0.12	97.43	2.45	0.00
18	6.3	6.30	0.10	96.84	3.06	0.00
19	6.1	6.10	0.16	97.89	1.95	0.00
20	6.32	6.30	0.10	96.84	3.06	0.00
21	6.11	6.10	0.16	97.89	1.95	0.00
22	6.22	6.20	0.12	97.43	2.45	0.00

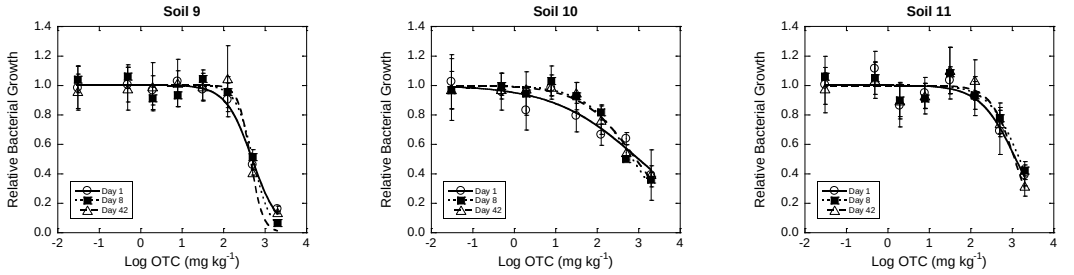
CTC: chlortetracycline. The superscript CTC^{X} is the valence of the antibiotic: positive (+), zwiterrionic (0) and negative (-) charge.


Soil 1
Soil 3
Soil 4
Relative Bacterial Growth
Log OTC (mg kg-1)
Day 1
Day 8
Day 42

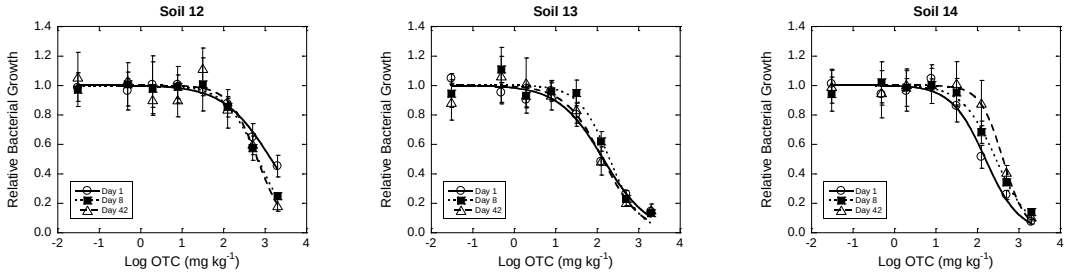
44


Soil 5
Soil 6
Soil 8
Relative Bacterial Growth
Log OTC (mg kg-1)
Day 1
Day 8
Day 42

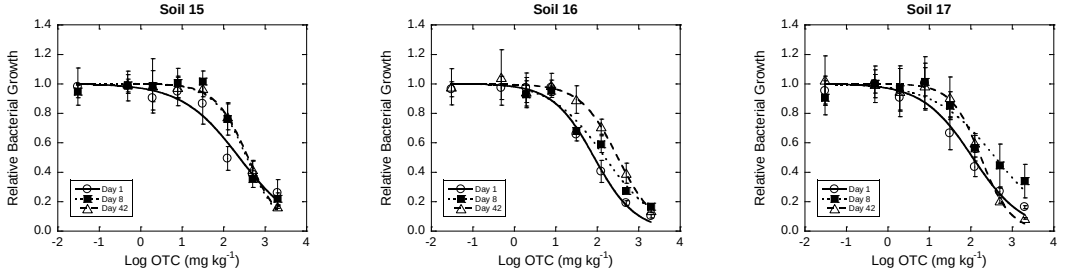
45


Soil 9
Soil 10
Soil 11
Relative Bacterial Growth
Log OTC (mg kg-1)
Day 1
Day 8
Day 42

46


Soil 12
Soil 13
Soil 14
Relative Bacterial Growth
Log OTC (mg kg-1)
Day 1
Day 8
Day 42

47


Soil 15
Soil 16
Soil 17
Relative Bacterial Growth
Log OTC (mg kg-1)
Day 1
Day 8
Day 42

48

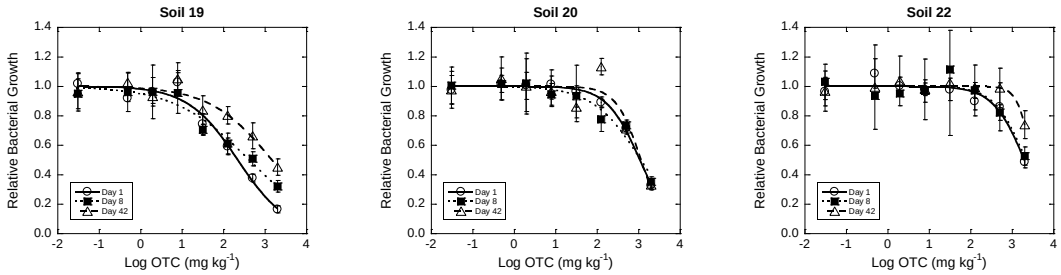
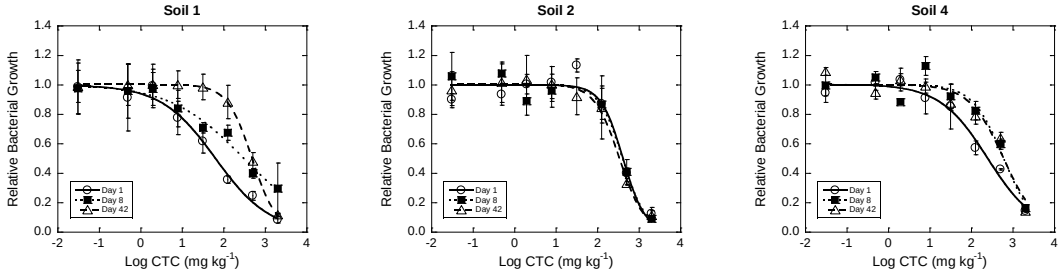
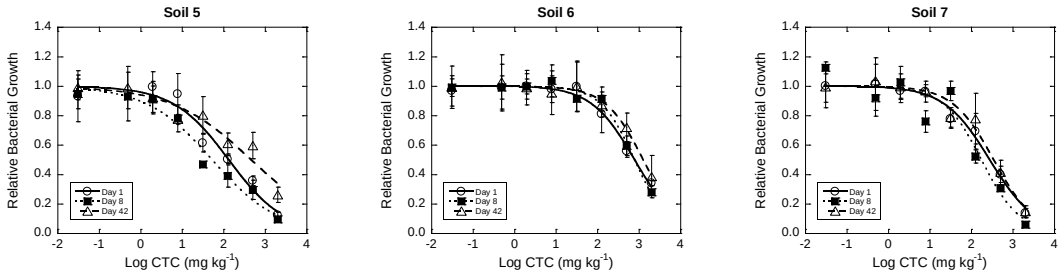
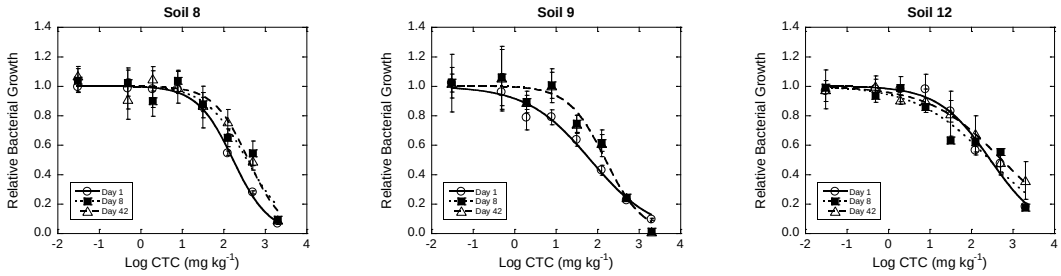
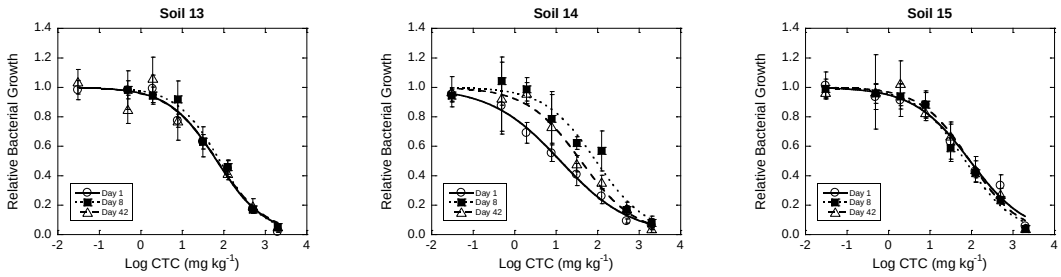


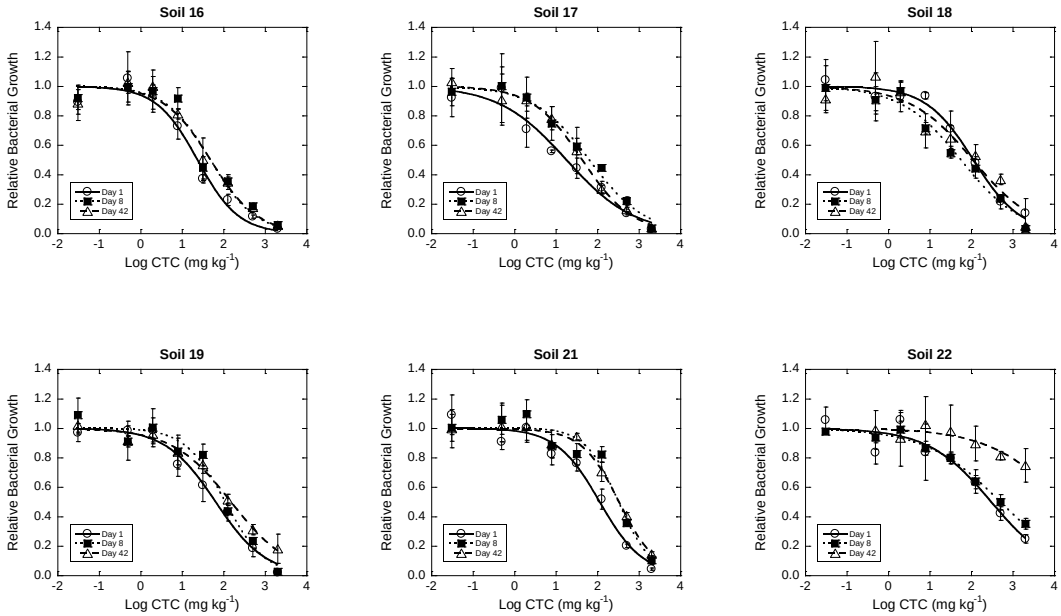
Fig. S1. Relative bacterial community growth in response to oxytetracycline (OTC) addition to the soil samples after 1, 8 and 42 incubation days in 18 soil samples studied remaining.











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60 **Fig. S2.** Relative bacterial community growth in response to chlortetracycline (CTC) addition to

61 the soil samples studied after 1, 8 and 42 incubation days in 18 soil samples studied remaining.

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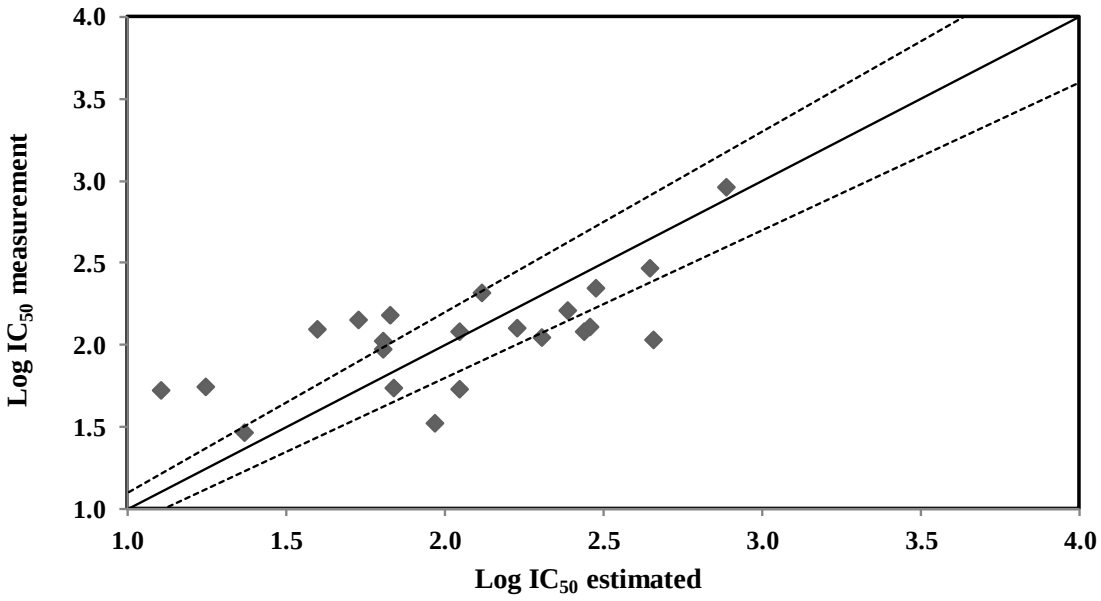

63

64 **Fig. S3.** Oxytetracycline log IC_{50} values estimated using Eq. (1) after 1 incubation day versus

65 measured log IC_{50} values, calculated using the logistic model. Continuous line represents a 1:1

66 relation, whereas discontinuous lines represent 10% deviation from the 1:1 line.

67

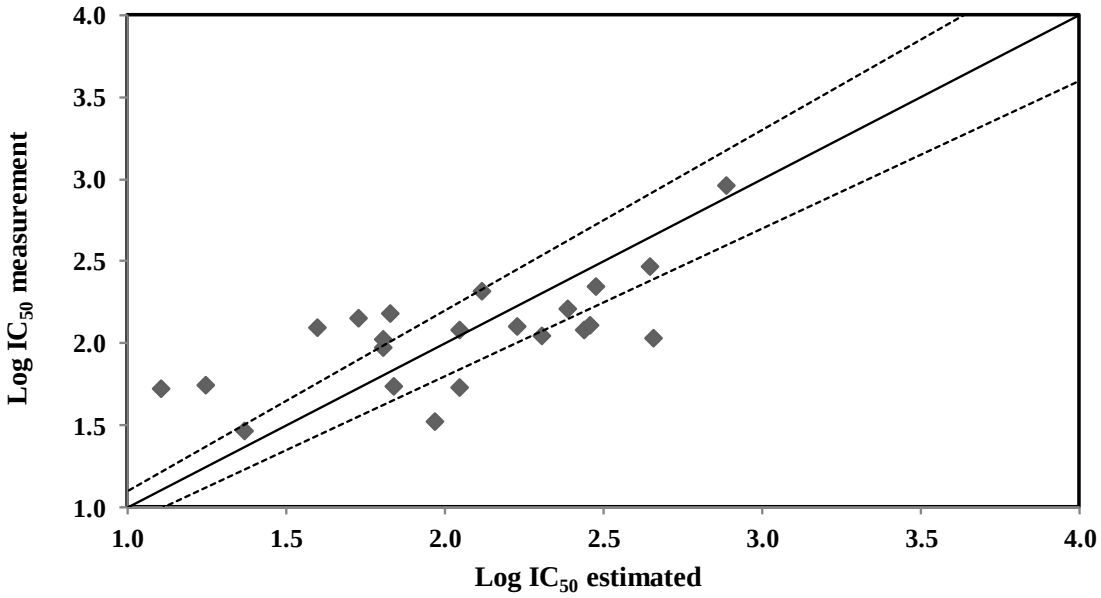

Fig. S4 Chlortetracycline **l**og IC_{50} values estimated using Eq. (1) after 1 incubation day versus measured log IC_{50} values, calculated using the logistic model. Continuous line represents a 1:1 relation, whereas discontinuous lines represent 10% deviation from the 1:1 line.