Supplementary Table 1 – Key properties of the manures applied in the spring and fall of 2012, and spring of 2013. Manure sourced from the same commercial farms was used in every instance.

Spring 2012

	Dry Matter	**Total N**	**NH_4-N**	**Organic matter content**	**C:N**	**pH**
Manure	%	%	mg/L	%		
Swine	2.4	0.28	1935	1.9	4:1	7.6
Dairy	2.3	0.17	872	1.8	6:1	6.9

Fall 2012

	Dry Matter	**Total N**	**NH_4-N**	**Organic matter content**	**C:N**	**pH**
Manure	%	%	mg/L	%		
Swine	0.8	0.2	1803	0.6	2.1	
Dairy	7.4	0.22	782	5.8	15:1	6.7

Spring 2013

	Dry Matter	**Total N**	**NH_4-N**	**Organic matter content**	**C:N**	**pH**
Manure	%	%	mg/L	%		
Swine	2.0	0.42	3168	1.2	2:1	7.2
Dairy	1.6	0.16	1037	1.2	3:1	7.3

Supplementary Table 2. Timing of manure application, crop planting and crop harvest. Indicated in brackets is the Julian day the indicated operation was undertaken, or in the case of planting and harvesting the number of days elapsed since the indicated manure application.

APPLICATION 2012 SPRING	**VEGETABLE**	**PLANT DATE 2012**	**HARVEST DATE 2012**	**PLANT DATE 2013 (days after application)**	**HARVEST DATE 2013 (days after application)**
Swine Apr. 10th (day 101)	Tomato (56d)	May 22nd (day143)	Aug 8th (day 221)		
	Lettuce (70d)	May 7th (day 128)	July 18th (day 200)	May 16th (401)	July 29th (475)
	Radish (22d)	July 17th (day 199)	Aug 16th (day 229)	May 16th (401)	Jun 25th (441)
	Carrot (75d)	May 28th (day 149)	Sept 10th (day 254)	Jul 15th (461)	Oct 22th (560)
Dairy Apr. 10th (day 101)	Tomato (56d)	May 22nd (day143)	Aug 8th (day 221)		
	Lettuce (70d)	May 7th (day 128)	July 18th (day 200)	May 16th (401)	July 29th (475)
	Radish (22d)	July 17th (day 199)	Aug 16th (day 229)	May 16th (401)	Jun 25th (441)
	Carrot (75d)	May 28th (day 149)	Sept 10th (day 254)	Jul 15th (461)	Oct 22th (560)
Control	Tomato (56d)	May 22nd (day143)	Aug 8th (day 221)		
	Lettuce (70d)	May 7th (day 128)	July 18th (day 200)	May 16th (401)	July 29th (475)
	Radish (22d)	July 17th (day 199)	Aug 16th (day 229)	May 16th (401)	Jun 25th (441)
	Carrot (75d)	May 28th (day 149)	Sept 10th (day 254)	Jul 15th (461)	Oct 22th (560)

APPLICATION 2012 FALL	**VEGETABLE**	**PLANT DATE 2013 (days after application)**	**HARVEST DATE 2013 (days after application)**

Swine Sept. 28th (day 272)	Lettuce (70d)	May 16th (229)	July 31st (305)
	Radish (22d)	May 16th (229)	Jun 26th (270)
	Carrot (75d)	Jul 15th (289)	Oct24th (390)
Dairy Sept. 28th (day 272)	Lettuce (70d)	May 16th (229)	July 31st (305)
	Radish (22d)	May 16th (229)	Jun 26th (270)
	Carrot (75d)	Jul 15th (289)	Oct24th (390)
Control	Lettuce (70d)	May 16th (229)	July 31st (305)
	Radish (22d)	May 16th (229)	Jun 26th (270)
	Carrot (75d)	Jul 15th (289)	Oct24th (390)
APPLICATION 2013 SPRING	**VEGETABLE**	**PLANT DATE 2013**	**HARVEST DATE 2013**
Swine May 7th (day 127)	Lettuce (70d)	May 27th (day 147)	Aug 1st (day213)
	Radish (22d)	Aug 12th (day 224)	Sep 23rd (day 266)
	Carrot (75d)	Jul 15th (day 196)	Oct 31st (day304)
Dairy May 7th (day 127)	Lettuce (70d)	May 27th (day 147)	Aug 1st (day213)
	Radish (22d)	Aug 12th (day 224)	Sep 23rd (day 266)
	Carrot (75d)	Jul 15th (day 196)	Oct 31st (day304)
Control	Lettuce (70d)	May 27th (day 147)	Aug 1st (day213)
	Radish (22d)	Aug 12th (day 224)	Sep 23rd (day 266)
	Carrot (75d)	Jul 15th (day 196)	Oct 31st (day304)

Table S3. The abundance of gene targets quantified in manures at the time of application.

	Gene copy number per gram of manure (wet weight)						
	sul1	*int1*	*erm*(B)	*str*(A)	*str*(B)	IncW *repA*	*rrnS*
Spring 2012							
Swine manure	3.9E+07	6.9E+08	2.1E+09	2.00E+08	3.7E+07	3.7E+07	8.5E+08
Dairy manure	1.1E+07	1.0E+07	3.4E+06	1.03E+07	5.5E+07	1.4E+06	1.2E+09
Fall 2012							
Swine manure	8.6E+08	6.8E+07	1.5E+10	1.5E+08	4.1E+08	1.5E+07	3.7E+10
Dairy manure	2.9E+08	2.8E+07	4.3E+08	3.8E+08	9.7E+08	1.5E+07	6.9E+10
Spring 2013							
Swine manure	4.1E+08	1.0E+07	4.2E+10	2.0E+07	5.9E+07	9.9E+05	6.6E+10
Dairy manure	5.4E+07	6.4E+06	1.0E+08	1.1E+07	3.1E+07	1.2E+06	3.5E+10

Table S4. Estimated loading rates for a representative manure application of 8500 US gal/acre. Key assumptions and a sample calculation are appended in a footnote.

	Gene copy number per gram of manured soil						
	sul1	*int1*	*erm*(B)	*str*(A)	*str*(B)	IncW *repA*	*rrnS*
Spring 2012							
Swine manure	1.23E+06	2.18E+07	6.63E+07	6.31E+06	1.17E+06	1.17E+06	2.68E+07
Dairy manure	3.47E+05	3.16E+05	1.07E+05	3.25E+05	1.74E+06	4.42E+04	3.79E+07
Fall 2012							
Swine manure	2.71E+07	2.15E+06	4.73E+08	4.73E+06	1.29E+07	4.73E+05	1.17E+09
Dairy manure	9.15E+06	8.84E+05	1.36E+07	1.20E+07	3.06E+07	4.73E+05	2.18E+09
Spring 2013							
Swine manure	1.29E+07	3.16E+05	1.33E+09	6.31E+05	1.86E+06	3.12E+04	2.08E+09
Dairy manure	1.70E+06	2.02E+05	3.16E+06	3.47E+05	9.78E+05	3.79E+04	1.10E+09

Table S4 sample calculation: Estimated soil loading rate for *sul1* in swine manure, spring 2012 application.

Assumptions:

Density of manure slurry is 1 kg/L

Bulk density of soil is 1.5 kg/L

Application rate is 8500 US gal/acre, equivalent to 71000 L/ha, and is uniformly incorporated to a depth of 15 cm

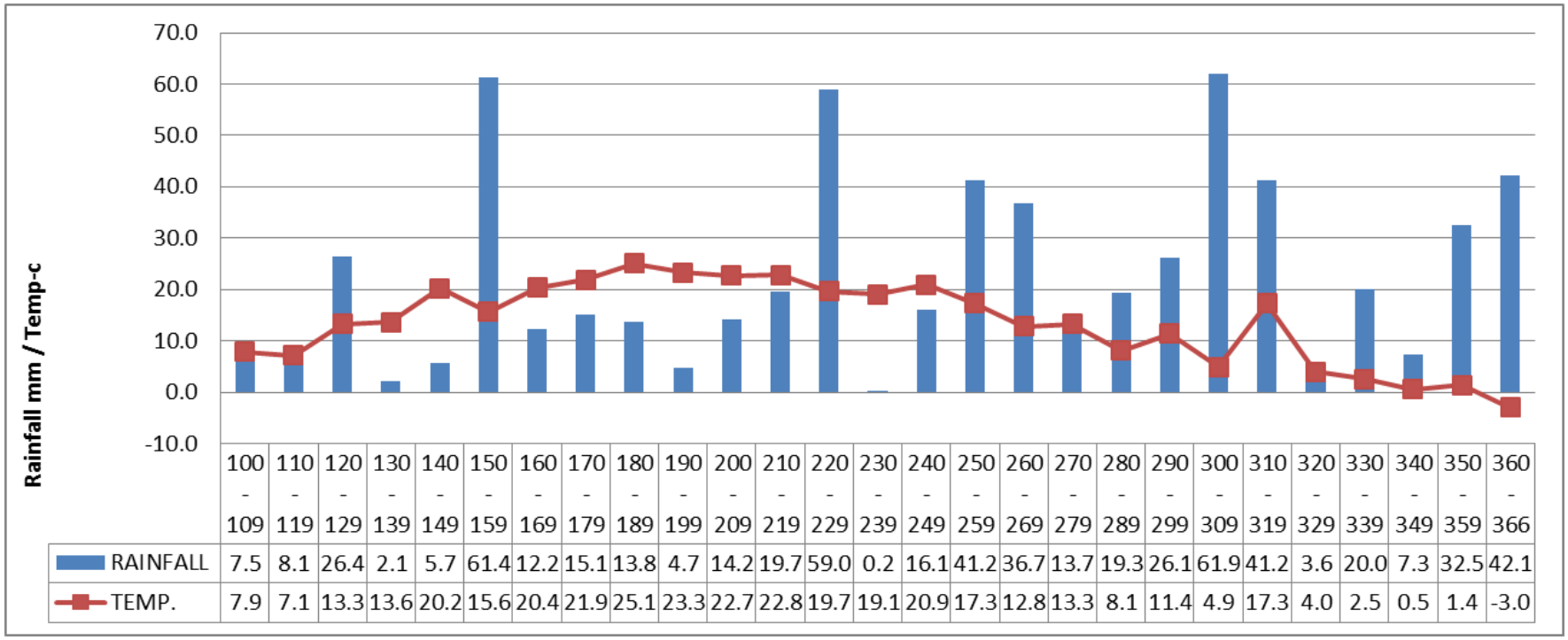
An area of 1 ha to a depth of 15 cm represents a volume of 1.5×10^6 L of soil, or a mass of 2.25×10^9 g of soil

The additional moisture conferred by the manure or antecedent moisture in the soil does not change bulk density

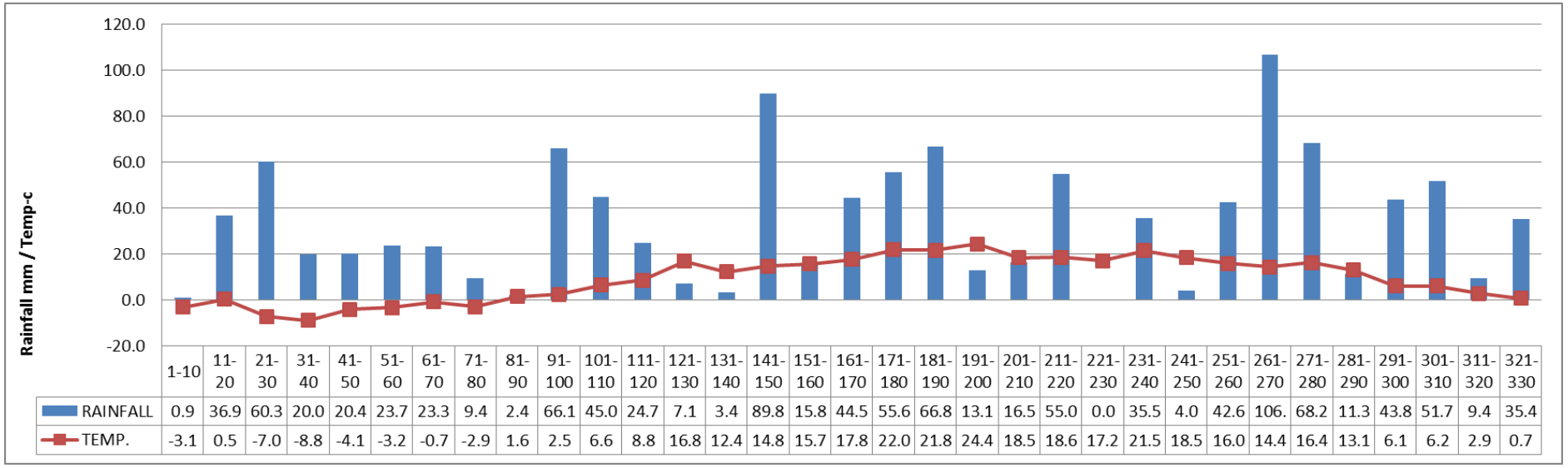
Calculation:

[3.9×10^{10} copies per kg manure X 71000 kg manure/ha] / 2.25×10^9 kg soil = 1.23×10^6 copies per g soil.

Figure S1. Air temperature and precipitaton during the period of observation in 2012 (top panel) and 2013 (bottom panel). Data are presented as a 10-day running average measured over the indicated Julian days.



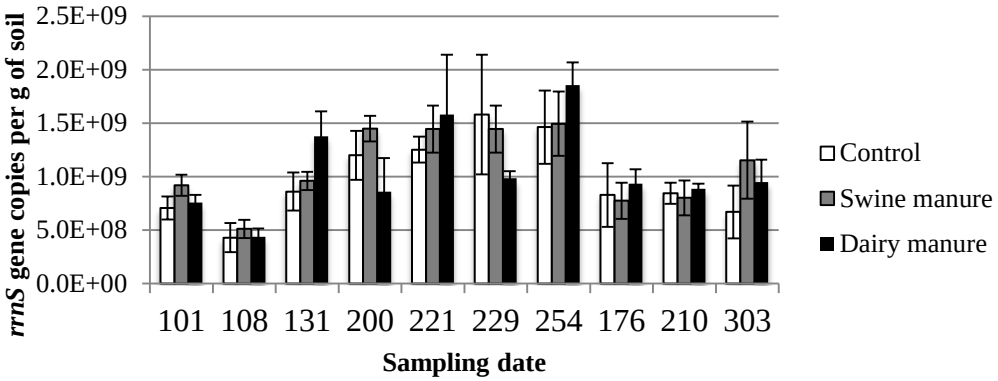
	100 - 109	110 - 119	120 - 129	130 - 139	140 - 149	150 - 159	160 - 169	170 - 179	180 - 189	190 - 199	200 - 209	210 - 219	220 - 229	230 - 239	240 - 249	250 - 259	260 - 269	270 - 279	280 - 289	290 - 299	300 - 309	310 - 319	320 - 329	330 - 339	340 - 349	350 - 359	360 - 366
RAINFALL	7.5	8.1	26.4	2.1	5.7	61.4	12.2	15.1	13.8	4.7	14.2	19.7	59.0	0.2	16.1	41.2	36.7	13.7	19.3	26.1	61.9	41.2	3.6	20.0	7.3	32.5	42.1
TEMP.	7.9	7.1	13.3	13.6	20.2	15.6	20.4	21.9	25.1	23.3	22.7	22.8	19.7	19.1	20.9	17.3	12.8	13.3	8.1	11.4	4.9	17.3	4.0	2.5	0.5	1.4	-3.0



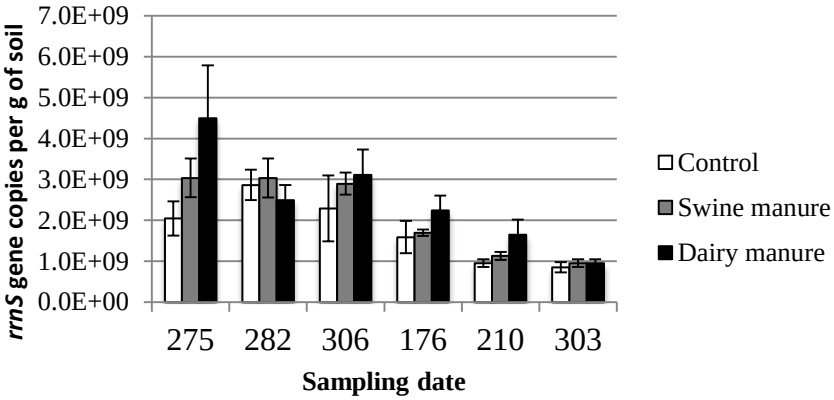
	1-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	91-100	101-110	111-120	121-130	131-140	141-150	151-160	161-170	171-180	181-190	191-200	201-210	211-220	221-230	231-240	241-250	251-260	261-270	271-280	281-290	291-300	301-310	311-320	321-330
RAINFALL	0.9	36.9	60.3	20.0	20.4	23.7	23.3	9.4	2.4	66.1	45.0	24.7	7.1	3.4	89.8	15.8	44.5	55.6	66.8	13.1	16.5	55.0	0.0	35.5	4.0	42.6	106.	68.2	11.3	43.8	51.7	9.4	35.4
TEMP.	-3.1	0.5	-7.0	-8.8	-4.1	-3.2	-0.7	-2.9	1.6	2.5	6.6	8.8	16.8	12.4	14.8	15.7	17.8	22.0	21.8	24.4	18.5	18.6	17.2	21.5	18.5	16.0	14.4	16.4	13.1	6.1	6.2	2.9	0.7

Supplemental Figure S2: Copy number of the *rrnS* gene target (on a soil wet weight basis) used to infer the size of 'total' bacterial soil populations. Sampling dates are given as Julian day. Data is presented as mean $\pm$ standard deviation.

rrnS gene quantification for S2012 application



rrnS gene quantification for F2012 application



rrnS gene quantification for S2013 application