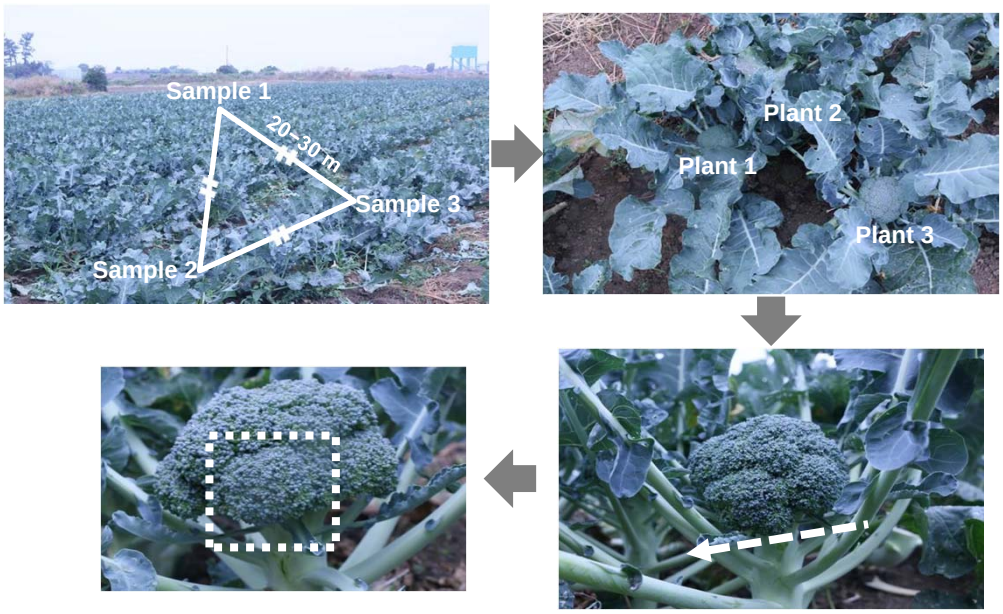
Supplementary Material

a



b

Region	Sub-region	Farm	Sample ID	Latitude, Longitude	Sampling date	Host growth[1]	Host health[2]
A (Daejeong)	A1	F1	1, 2, 3	33°12'49.4"N 126°16'26.8"E	Nov 1, 2014	immature	healthy
	A2	F2	4, 5, 6	33°14'34.3"N 126°13'33.4"E	Jan 11, 2015	mature	healthy
		F3	7, 8, 9	33°14'34.2"N 126°13'37.1"E	Jan 11, 2015	mature	healthy
		F4	10, 11, 12	33°14'34.3"N 126°13'59.0"E	Jan 24, 2015	mature	healthy
		F5	13, 14, 15	33°14'12.3"N 126°14'04.7"E	Jan 24, 2015	mature	healthy
	A3	F6	16, 17, 18	33°13'58.2"N 126°14'41.1"E	Jan 24, 2015	mature	healthy
B (Hallim)	B1	F1	19, 20, 21	33°24'44.0"N 126°17'57.6"E	Nov 8, 2014	immature	healthy
		F2	22, 23, 24	33°24'43.5"N 126°17'59.2"E	Dec 7, 2014	mature	healthy
	B2	F3	25, 26, 27	33°21'27.8"N 126°16'48.8"E	Feb 8, 2015	mature	healthy
		F4	28, 29, 30	33°21'27.1"N 126°16'50.3"E	Feb 8, 2015	mature	healthy
		F5	31, 32, 33	33°21'29.3"N 126°16'50.3"E	Feb 8, 2015	mature	healthy
C (Jocheon)	C1	F1	34, 35, 36	33°31'50.4"N 126°37'20.3"E	Dec 3, 2014	immature	damaged
		F2	37, 38, 39	33°31'49.7"N 126°37'18.5"E	Jan 8, 2015	mature	damaged
		F3	40, 41, 42	33°32'11.5"N 126°37'30.5"E	Jan 22, 2015	mature	damaged
		F4	43, 44, 45	33°32'11.5"N 126°37'29.9"E	Jan 22, 2015	mature	damaged
	C2	F5	46, 47, 48	33°31'16.6"N 126°36'23.9"E	Jan 22, 2015	mature	damaged
D (Seongsan)	D1	F1	49, 50, 51	33°26'11.1"N 126°55'01.8"E	Nov 17, 2014	immature	healthy
		F2	52, 53, 54	33°26'21.4"N 126°54'33.0"E	Dec 6, 2014	mature	healthy
	D2	F3	55, 56, 57	33°25'25.1"N 126°53'46.9"E	Dec 29, 2014	mature	healthy
		F4	58, 59, 60	33°25'31.1"N 126°54'03.0"E	Dec 29, 2014	mature	healthy
		F5	61, 62, 63	33°24'13.8"N 126°53'07.5"E	Dec 29, 2014	mature	healthy
		F6	64, 65, 66	33°24'15.4"N 126°53'07.3"E	Dec 29, 2014	mature	healthy

[1]The immature and mature plants were collected in 8-9 weeks and 15-16 weeks after seeding, respectively.

[2]Broccoli crops were damaged by black rot and downy mildew before sampling.

Fig. S1. The images of the farms, broccoli plants and their flower heads (a), and sampling locations (b) are shown.

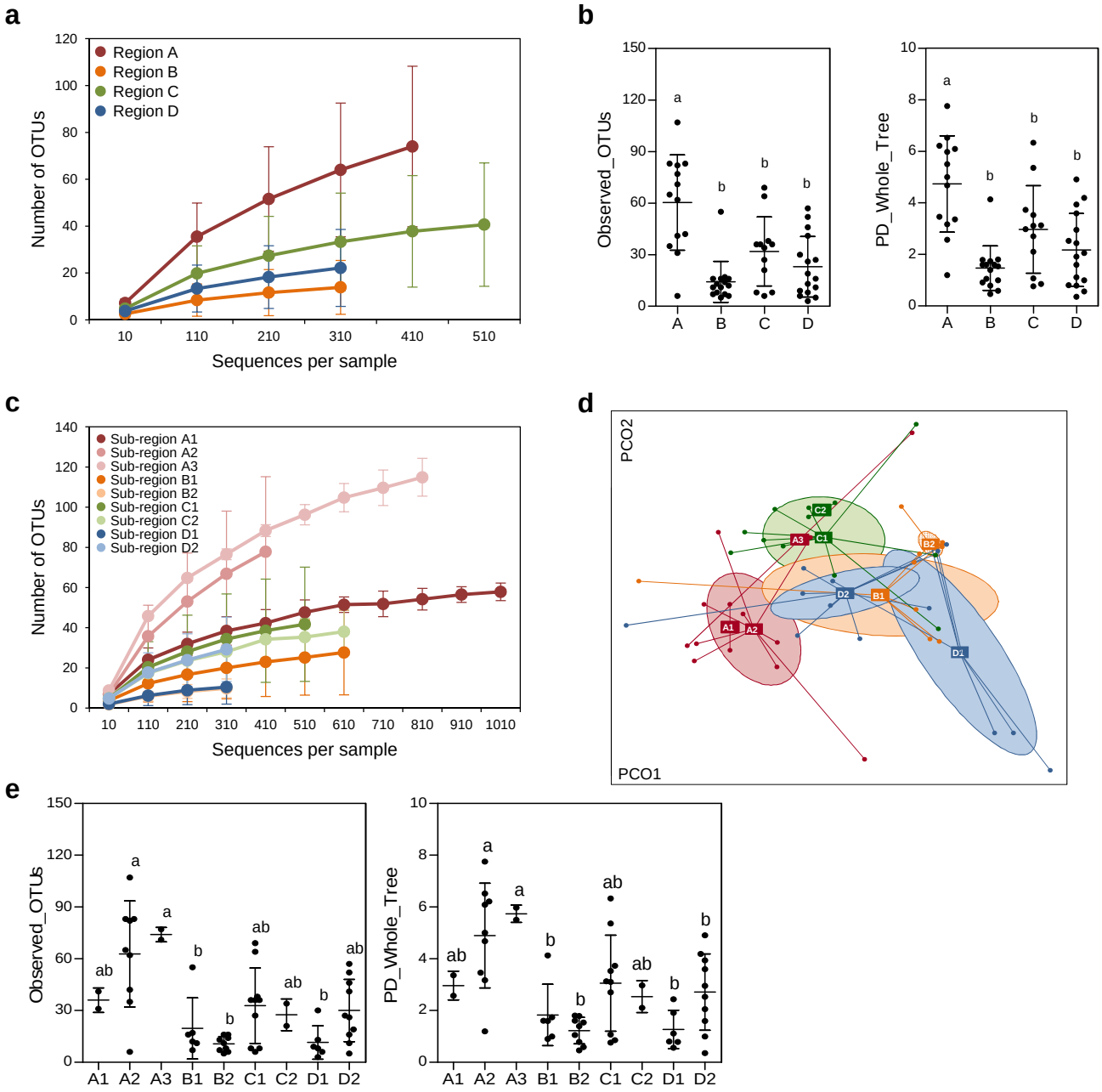


Fig. S2. Rarefaction curves and sub-region variation in the bacterial communities. (a) Rarefaction curves of bacterial OTUs in the four regions were shown. (b) Bacterial community diversity of the four regions was compared on the basis of weighted UniFrac distance. (c) Rarefaction curves of bacterial OTUs in the nine sub-regions were shown. Bacterial community composition (d) and diversity (e) of the nine sub-regions were compared using weighted UniFrac distance-based Principal Coordinates Analysis, with 95% confidence ellipses. Statistical significance was evaluated using *Adonis* with 999 permutations and one-way ANOVA with Tukey post-hoc test.

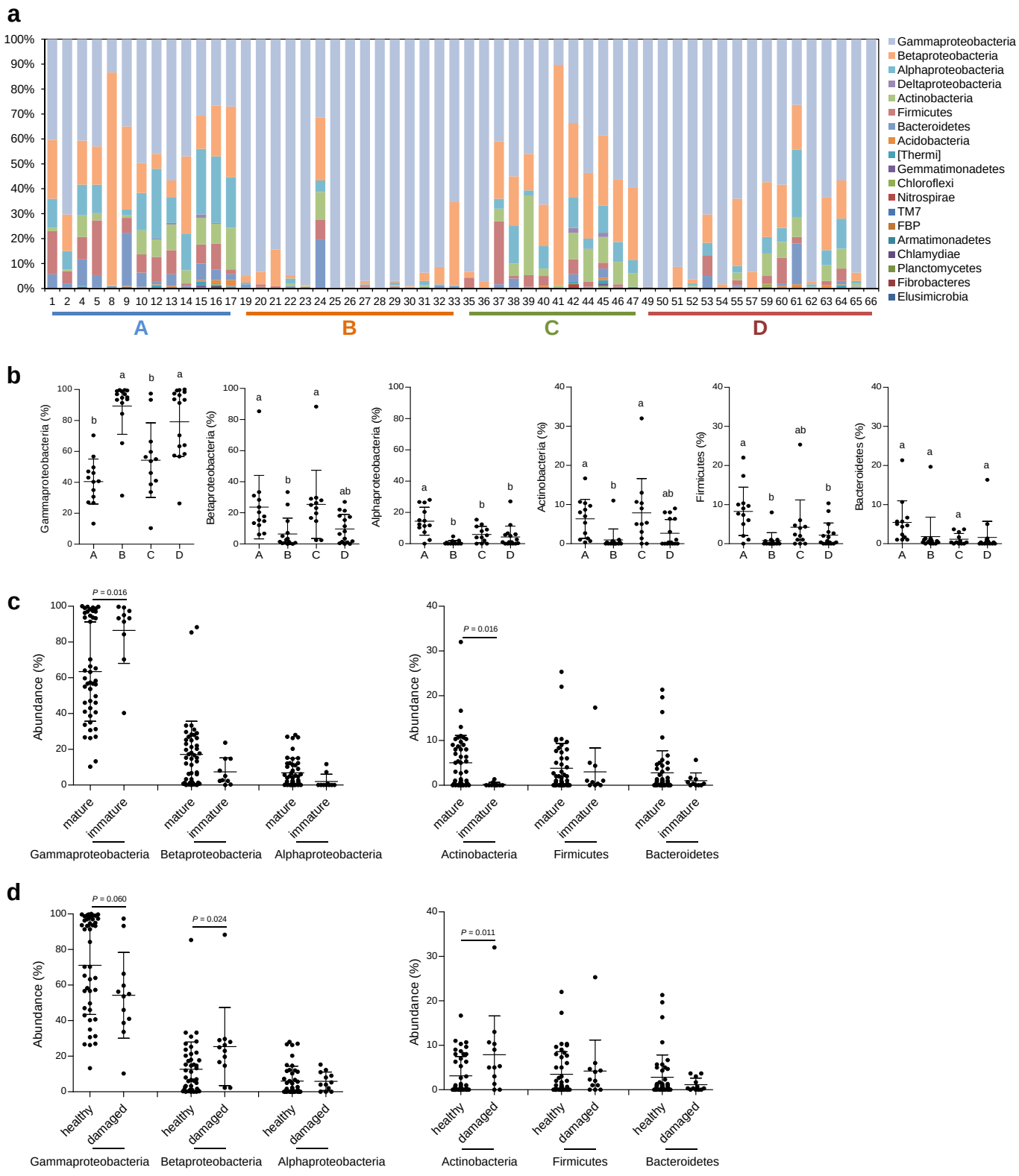


Fig. S3. Phylum-level comparisons of bacterial communities by farming region, host growth and health. (a) The relative abundance of 16 phyla detected on broccoli florets were shown in a bar plot. The relative abundance of the phyla *Proteobacteria*, *Actinobacteria*, *Firmicutes* and *Bacteroidetes* were compared by farming region (b), host growth (c) and health (d). Statistical significance was evaluated using one-way ANOVA with Tukey post-hoc test and two-tailed unpaired Student's *t*-test.

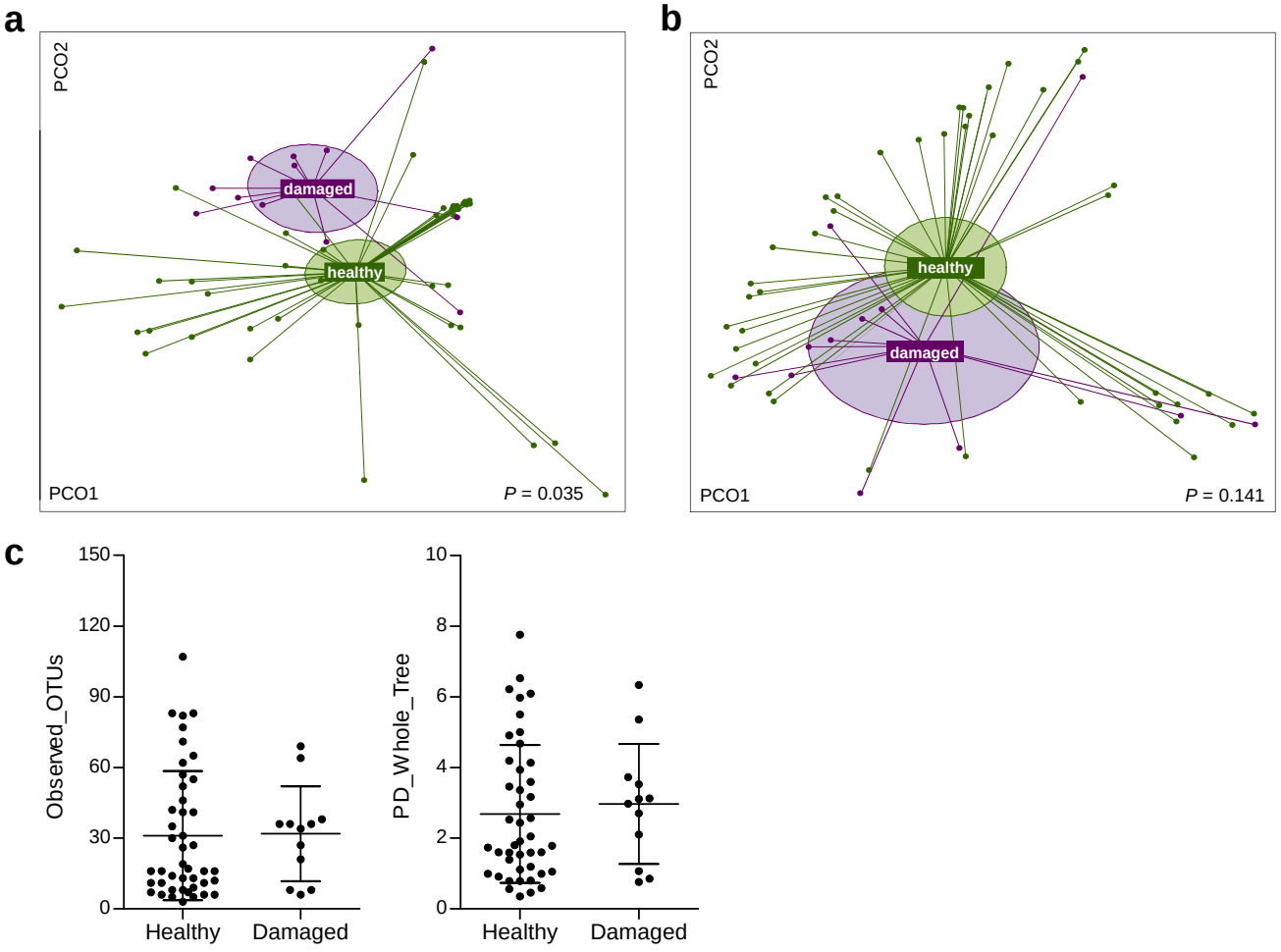


Fig. S4. (a) Viable bacteria, *Enterobacteriaceae* and coliform bacteria were estimated using cell culture, and compared by host growth. Bacterial community composition (b) and diversity (c) were compared by host health. All data are mean±SD.

Table S1. Sequence information

Region	Sub-region	Sample	#raw reads	#quality-filtered	#chloroplast	#mitochondria	#unassigned	#final reads
A	A1	1	1,223	1,214	1	13	1	1,199
		2	4,566	4,559	0	71	2	4,486
	A2	4	3,753	3,718	1	1,560	9	2,148
		5	3,750	3,727	1	1,136	9	2,581
		8	787	787	0	0	0	787
		9	1,928	1,913	0	36	0	1,877
		10	1,840	1,834	6	1,414	2	412
		11	409	407	0	256	0	151
		12	1,614	1,583	2	335	5	1,241
		13	2,001	1,955	0	597	11	1,347
		14	1,799	1,781	1	266	4	1,510
		15	943	898	0	139	7	752
	A3	16	1,006	985	0	111	3	871
		17	1,967	1,812	9	120	8	1,675
B	B1	19	1,575	1,575	1	43	0	1,531
		20	986	986	0	0	0	986
		21	890	890	0	0	0	890
		22	2,030	2,030	0	0	0	2,030
		23	2,028	2,027	0	3	0	2,024
		24	714	708	0	41	0	667
	B2	25	1,097	1,095	0	0	0	1,095
		26	387	387	0	0	0	387
		27	764	763	0	48	0	715
		28	1,217	1,216	0	0	0	1,216
		29	3,706	3,703	0	2	0	3,701
		30	2,894	2,889	0	0	0	2,889
		31	2,108	2,105	0	0	0	2,105
		32	2,862	2,857	0	0	2	2,855
		33	609	609	0	0	0	609
C	C1	35	790	789	0	2	0	787
		36	937	937	0	1	0	936
		37	1,613	1,606	25	960	0	621
		38	1,780	1,776	30	1,050	0	696
		39	1,964	1,963	1	158	0	1,804
		40	3,931	3,916	103	2,078	0	1,735
		41	612	610	0	1	0	609
		42	2,984	2,959	82	1,411	6	1,460
		44	1,411	1,409	52	664	0	693
		45	1,378	1,352	72	615	3	662
	C2	46	1,303	1,292	30	625	0	637
		47	1,642	1,601	44	686	0	871
D	D1	49	1,011	1,011	0	0	0	1,011
		50	1,000	1,000	0	0	0	1,000
		51	884	884	0	0	0	884
		52	2,776	2,772	0	1	0	2,771
		53	377	374	0	0	0	374
		54	917	915	0	0	0	915
	D2	55	1,471	1,466	13	144	0	1,309
		57	1,479	1,478	0	0	0	1,478
		59	1,690	1,687	55	1,004	2	626
		60	1,937	1,933	78	1,291	3	561
		61	539	531	0	214	0	317
		62	657	657	0	3	0	654
		63	1,795	1,791	29	266	1	1,495
		64	1,953	1,940	15	403	6	1,516
		65	1,340	1,337	0	13	2	1,322
		66	2,703	2,703	0	0	0	2,703

Table S2. Meteorological parameters in the four regions

Region	Sub-region	Farm	Temperature (°C)[1,2]	Relative humidity (%)[1,2]	Precipitation (mm)[1,2]	Insolation (hr)[1,2]	Cloud cover[1,2]
A	A1	F1	16.3±2.1	72.8±10.4	3.5±3.8	6.1±4.7	5.1±3.8
	A2	F2	7.5±2.6	68.4±7.9	4.3±9.6	5.0±3.5	5.7±2.8
		F3	7.5±2.6	68.4±7.9	4.3±9.6	5.0±3.5	5.7±2.8
		F4	6.5±2.4	71.4±9.3	2.9±4.9	4.0±3.4	6.8±1.9
		F5	6.5±2.4	71.4±9.3	2.9±4.9	4.0±3.4	6.8±1.9
	A3	F6	6.5±2.4	71.4±9.3	2.9±4.9	4.0±3.4	6.8±1.9
B	B1	F1	13.9±2.0	64.9±8.9	2.6±3.6	4.1±3.3	5.8±2.6
		F2	8.0±2.6	66.2±7.5	3.4±4.5	1.3±1.9	7.8±1.4
	B2	F3	6.3±2.7	60.8±6.7	2.3±5.2	3.7±3.8	5.9±2.9
		F4	6.3±2.7	60.8±6.7	2.3±5.2	3.7±3.8	5.9±2.9
		F5	6.3±2.7	60.8±6.7	2.3±5.2	3.7±3.8	5.9±2.9
C	C1	F1	9.8±3.7	70.6±7.7	5.9±7.8	2.0±2.4	7.2±1.9
		F2	7.9±1.8	66.6±8.5	8.2±13.4	3.5±2.8	6.2±2.5
		F3	7.5±1.9	68.9±9.3	4.9±6.7	3.0±2.7	6.8±2.2
		F4	7.5±1.9	68.9±9.3	4.9±6.7	3.0±2.7	6.8±2.2
	C2	F5	7.5±1.9	68.9±9.3	4.9±6.7	3.0±2.7	6.8±2.2
D	D1	F1	12.2±2.8	68.3±7.6	5.6±13.3	6.4±3.1	4.9±2.1
		F2	7.3±3.8	73.5±8.4	5.4±6.8	4.4±2.5	7.4±1.7
	D2	F3	6.5±2.8	66.5±6.3	2.7±3.6	5.8±2.4	5.1±2.4
		F4	6.5±2.8	66.5±6.3	2.7±3.6	5.8±2.4	5.1±2.4
		F5	6.5±2.8	66.5±6.3	2.7±3.6	5.8±2.4	5.1±2.4
		F6	6.5±2.8	66.5±6.3	2.7±3.6	5.8±2.4	5.1±2.4

[1]The temperature, relative humidity, precipitation, insolation and cloud cover were averaged from a week before and after of the sampling date.

[2]All values are shown as mean±SD.