

Supporting Information

Table S1. Information on the 40 sampled fields, including farming system (OF, organic farming; CF, conventional farming), agricultural management (Cereal or Mixed crops), type of cereal sown, type of legume sown, and geographical coordinates of the centroids of fields (X, Y in Lambert 93).

Field ID	Farming system	Agricultural management	Cereal	Legume	X	Y
BIOHME- 02	OF	Mixed	Triticale	Pea	333958.23	6770041.94
BIOHME- 03	OF	Mixed	Triticale	Pea	333977.97	6770420.40
BIOHME- 05	CF	Cereal	Wheat		334784.02	6769663.86
BIOHME- 06	OF	Cereal	Oat		369341.46	6779351.74
BIOHME- 07	OF	Cereal	Wheat		372651.42	6767062.04
BIOHME- 08	OF	Mixed	Wheat	Pea	374262.22	6768877.77
BIOHME- 09	OF	Cereal	Wheat		334654.81	6764298.01
BIOHME- 10	OF	Cereal	Wheat		371222.70	6783500.25
BIOHME- 11	CF	Cereal	Wheat		371435.02	6783969.07
BIOHME- 12	CF	Cereal	Wheat		333414.08	6769704.06
BIOHME- 15	OF	Mixed	Triticale	Pea	371757.94	6779016.34
BIOHME- 16	CF	Cereal	Wheat		371301.91	6777595.01
BIOHME- 17	CF	Cereal	Wheat		371312.17	6776879.13
BIOHME- 18	CF	Cereal	Wheat		334307.26	6764886.78
BIOHME- 20	CF	Cereal	Wheat		356135.55	6771350.36
BIOHME- 21	OF	Cereal	Wheat		367827.84	6781428.36
BIOHME- 22	CF	Cereal	Wheat		368436.15	6781375.84
BIOHME- 23	CF	Cereal	Wheat		368561.94	6779962.87
BIOHME- 24	CF	Cereal	Wheat		364699.40	6780285.84
BIOHME- 25	CF	Cereal	Wheat		364658.23	6780099.37
BIOHME- 28	CF	Cereal	Wheat		367118.76	6780810.42
BIOHME- 30	OF	Cereal	Wheat		372766.13	6776644.83
BIOHME- 31	OF	Cereal	Wheat		369612.23	6779471.08
BIOHME- 33	CF	Cereal	Wheat		329237.83	6771400.20
BIOHME- 34	CF	Cereal	Wheat		327280.54	6766995.57
BIOHME- 36	CF	Cereal	Wheat		374344.55	6788438.26
BIOHME- 39	CF	Cereal	Wheat		348971.40	6754516.46
BIOHME- 42	OF	Cereal	Wheat		356087.50	6770944.10
BIOHME- 43	OF	Mixed	Wheat	Faba bean	347115.93	6754965.30
BIOHME- 44	OF	Mixed	Wheat	Faba bean	348732.40	6757501.45
BIOHME- 45	CF	Cereal	Wheat		327654.21	6777238.06
BIOHME- 47	OF	Mixed	Triticale	Faba bean	379421.67	6773881.05
BIOHME- 49	OF	Mixed	Triticale	Pea and Faba bean	375543.91	6784937.66
BIOHME- 50	OF	Cereal	Wheat		373653.06	6788907.00
BIOHME- 51	CF	Cereal	Wheat		348060.25	6756878.08

BIOHME- 54	OF	Mixed	Triticale	Pea	336148.18	6769064.83
BIOHME- 57	OF	Mixed	Oat and triticale	Pea and Faba bean	339624.43	6768034.24
BIOHME- 58	CF	Cereal	Wheat		339417.04	6768238.26
BIOHME- 60	CF	Cereal	Triticale		374062.94	6769136.01
BIOHME- 99	OF	Cereal	Wheat		332336.10	6772639.80

Table S2. Spearman correlation matrix between landscape variables at 250, 500 and 1000 m. OF, Organic farming; SNH, Semi-natural habitats (including woodlands and grass strips); HD, Hedgerow density.

	% OF_1000 m	% SNH_1000 m	HD_1000 m	% OF_500 m	% SNH_500 m	HD_500 m	% OF_250 m	% SNH_250 m	HD_250 m
% OF_1000 m	1.00								
% SNH_1000 m	-0.33	1.00							
HD_1000 m	0.17	-0.07	1.00						
% OF_500 m	0.71	-0.19	0.12	1.00					
% SNH_500 m	-0.46	0.79	-0.08	-0.38	1.00				
HD_500 m	0.10	-0.13	0.61	0.10	-0.02	1.00			
% OF_250 m	0.46	0.08	0.04	0.83	-0.08	0.16	1.00		
% SNH_250 m	-0.38	0.51	-0.01	-0.62	0.72	0.03	-0.33	1.00	
HD_250 m	0.07	-0.07	0.39	0.06	0.11	0.68	0.09	0.23	1.00

1 **Table S3. Abundance of arthropods trapped using the vacuum method (D-vac).** N,
2 number of replicates; CF, conventional fields; OF, organic fields.

	N	Spiders	Carabids	Ladybug larvae	Staphylinids	Aphids
Hedgerows	40	10,623	6689	64	6356	366
Crop fields (all)	40	7197	4274	95	2034	3048
CF	20	2336	1838	12	649	436
OF 'Cereal crops'	10	1277	717	13	271	266
OF Mixed crops'	10	3584	1719	70	1114	2346

3

4 **Table S4. Results from generalised linear mixed models (GLMMs) of the effects of**
 5 **habitat type (crop fields vs. hedgerows) on the biodiversity-related multifunctionality**
 6 **index (standardised using the maximum value) and ecological performance (i.e.**
 7 **conservation, pollination, pest control and pest infestation).** Values in bold indicate
 8 significant effects (* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$).
 9

	Multifunctionality index	Ecological performance								
		Conservation		Pollination		Pest control		Pest infestation		
		Estimate ± SE	p	Estimate ± SE	p	Estimate ± SE	p	Estimate ± SE	p	
(Intercept)	-0.22 ± 0.07	**	-0.21 ± 0.09	*	-1.50 ± 0.19	***	-1.57 ± 0.16	***	-2.28 ± 0.16	***
Habitat type (Hedgerow)	0.21 ± 0.09	*	0.48 ± 0.11	***	0.61 ± 0.24	*	0.74 ± 0.17	***	0.56 ± 0.19	**

10

11 **Table S5. Results from linear mixed models (LMMs) of the effects of habitat type (crop
 12 fields vs. hedgerows) on the biodiversity-related multifunctionality index (standardised
 13 using the z-score) and ecological performance (i.e. conservation, pollination, pest control
 14 and pest infestation). Values in bold indicate significant effects (* $p < 0.05$, ** $p < 0.01$, *** p
 15 <0.001; ns, not significant).
 16**

Multifunctionality index	Ecological performance							
	Conservation		Pollination		Pest control		Pest infestation	
	Estimate ± SE	p	Estimate ± SE	p	Estimate ± SE	p	Estimate ± SE	p
(Intercept)	0.16 ± 0.08	*	-0.25 ± 0.11	*	-0.17 ± 0.16	ns	-0.36 ± 0.15	ns
Habitat type (Hedgerow)	0.33 ± 0.09	***	0.51 ± 0.13	***	0.34 ± 0.22	ns	0.72 ± 0.19	***

17

18 **Table S6. Results from generalised linear models (GLMs) of the effects of agricultural**
 19 **management (CF vs. OF ‘Cereal crops’ vs. OF ‘Mixed crops’) on the agroecosystem**
 20 **multifunctionality index (standardised using the maximum value) and individual**
 21 **functions.** Values in bold indicate significant effects (* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$; ns,
 22 not significant).

	R ²	Intercept	OF ‘Cereal crops’	OF ‘Mixed crops’
		Estimate ± SE	Estimate ± SE	Estimate ± SE
Multifunctionality index	0.28	-0.09 ± 0.06 n.s.	0.11 ± 0.10 n.s.	0.41 ± 0.10 ***
Ecological performance	Conservation	0.75	-0.81 ± 0.10 ***	1.29 ± 0.17 ***
	Pollination	0.77	-2.38 ± 0.27 ***	2.11 ± 0.38 ***
	Pest control	0.44	-1.10 ± 0.18 ***	-2.90e-05 ± 0.31 n.s.
	Pest infestation	0.41	-2.43 ± 0.25 ***	0.90 ± 0.34 **
Socio-economic performances=	Labour	0.08	-0.29 ± 0.16 n.s.	0.50 ± 0.28 n.s.
	Semi-net margin	0.01	-0.35 ± 0.18 n.s.	-0.07 ± 0.32 n.s.
Agronomic performance	Yield	0.64	1.69 ± 0.18 ***	-1.73 ± 0.27 ***

23

24 **Table S7. (a) Results from linear models (LMs) of the effects of agricultural**
 25 **management (CF vs. OF ‘Cereal crops’ vs. OF ‘Mixed crops’) on the agroecosystem**
 26 **multifunctionality index (standardised using the z-score) and individual functions.**
 27 Values in bold indicate significant effects (* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$; ns, not
 28 significant). **(b) Details of the mean values (\pm SE) of the standardised proxies of**
 29 **functions.** Different letters indicate significant differences between the two habitats (pairwise
 30 comparison with least squares means calculated using the ‘emmeans’ R package).

31
 32 a)

		R ²	Intercept	OF ‘Cereal crops’	OF ‘Mixed crops’
			Estimate \pm SE	Estimate \pm SE	Estimate \pm SE
Multifunctionality index		0.18	-0.09 \pm 0.07 n.s.	0.01 \pm 0.12 n.s.	0.33 \pm 0.12 **
Ecological performance	Conservation	0.74	-0.70 \pm 0.10 ***	1.17 \pm 0.17 ***	1.62 \pm 0.17 ***
	Pollination	0.72	-0.82 \pm 0.12 ***	1.40 \pm 0.21 ***	1.89 \pm 0.21 ***
	Pest control	0.50	-1.38 \pm 0.16 *	-0.05 \pm 0.28 n.s.	1.59 \pm 0.28 ***
	Pest infestation	0.29	-2.38 \pm 0.15 *	0.58 \pm 0.25 *	0.96 \pm 0.25 ***
Socio-economic performance	Labour	0.06	-0.10 \pm 0.22 n.s.	0.50 \pm 0.38 n.s.	-0.11 \pm 0.38 n.s.
	Semi-net margin	0.003	0.01 \pm 0.23 n.s.	0.06 \pm 0.39 n.s.	-0.11 \pm 0.39 n.s.
Agronomic performance	Yield	0.69	0.81 \pm 0.13 ***	-1.42 \pm 0.22 ***	-1.81 \pm 0.22 ***

33

34 b)

	CF	OF ‘Cereal crops’	OF ‘Mixed crops’
Multifunctionality index	-0.09 \pm 0.24 a	-0.07 \pm 0.40 ab	0.24 \pm 0.34 b
Conservation	0.69 \pm 0.41 a	0.47 \pm 0.52 b	0.92 \pm 0.40 b
Pollination	-0.82 \pm 0.09 a	0.58 \pm 0.76 b	1.06 \pm 0.77 b
Pest regulation	-0.38 \pm 0.53 a	-0.44 \pm 0.44 a	1.21 \pm 1.17 b
Pest infestation	-0.38 \pm 0.31 a	0.19 \pm 0.71 ab	0.57 \pm 1.02 b
Labour	-0.10 \pm 0.68 n.s.	0.40 \pm 1.26 n.s.	-0.20 \pm 1.24 n.s.
Semi-net margin	0.01 \pm 0.96 n.s.	0.07 \pm 1.27 n.s.	-0.09 \pm 0.86 n.s.
Yield	0.80 \pm 0.44 a	-0.61 \pm 0.79 b	-1.00 \pm 0.56 b

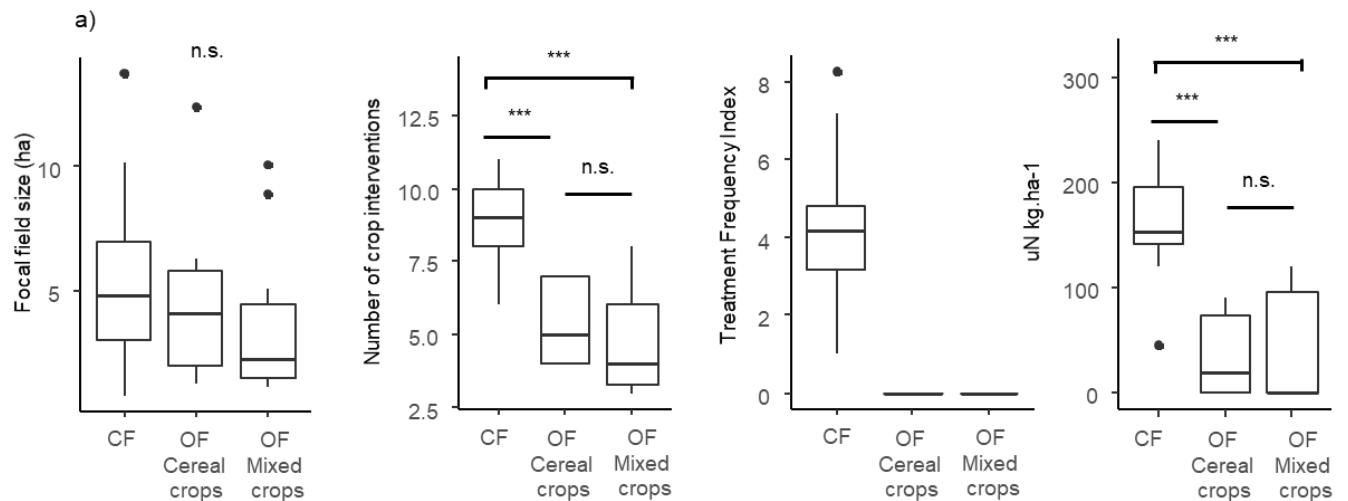
35

36 **Table S8. Results from the model averaging procedure based on generalised linear
37 models (GLMs) of the effects of local farming system (conventional vs. organic) and
38 landscape heterogeneity on the agroecosystem multifunctionality index (standardised
39 using the maximum value) and individual functions, at three spatial scales.** Values in
40 bold indicate significant effects (i.e. the confidence interval at 0.95 does not encompass the
41 zero value). RI, relative importance of variables.
42

	Pseudo R ² full model	Intercept Estimate ± SE	Local OF Estimate ± SE	RI	% OF Estimate ± SE	RI	% SNH Estimate ± SE	RI	Hedgerow density Estimate ± SE	RI	
a) 250 m											
Multifunctionality index	0.24	-0.08 ± 0.07	0.24 ± 0.09	1.00	0.01 ± 0.04	0.19	0.01 ± 0.04	0.18	0.11 ± 0.11	0.63	
Ecological performance	Conservation	0.77	-0.84 ± 0.11	1.55 ± 0.16	1.00	-0.14 ± 0.19	0.52	0.16 ± 0.17	0.59	0.04 ± 0.10	0.32
	Pollination	0.76	-2.35 ± 0.30	2.58 ± 0.39	1.00	-0.23 ± 0.35	0.44	0.07 ± 0.20	0.26	0.08 ± 0.21	0.28
	Pest control	0.23	-1.13 ± 0.24	1.00 ± 0.36	1.00	-0.46 ± 0.43	0.66	0.18 ± 0.29	0.44	-0.03 ± 0.14	0.20
	Pest infestation	0.38	-2.45 ± 0.26	1.19 ± 0.30	1.00	-0.04 ± 0.16	0.19	0.06 ± 0.18	0.25	-0.12 ± 0.24	0.33
Socio-economic performance	Labour	0.10	-0.23 ± 0.15	0.10 ± 0.20	0.36	-0.06 ± 0.17	0.24	0.01 ± 0.10	0.15	-0.01 ± 0.09	0.15
	Semi-net margin	0.28	0.30 ± 0.19	-0.29 ± 0.31	0.62	0.80 ± 0.28	1.00	-0.03 ± 0.14	0.24	0.19 ± 0.26	0.49
Agronomic performance	Yield	0.64	1.72 ± 0.19	-1.96 ± 0.25	1.00	0.10 ± 0.20	0.33	0.10 ± 0.19	0.39	0.01 ± 0.11	0.20
b) 500 m											
Multifunctionality index	0.20	-0.09 ± 0.07	0.26 ± 0.10	1.00	0.02 ± 0.06	0.22	0.02 ± 0.06	0.24	-0.01 ± 0.04	0.14	
Ecological performance	Conservation	0.80	-0.86 ± 0.10	1.61 ± 0.15	1.00	-0.19 ± 0.19	0.62	0.36 ± 0.18	0.90	0.01 ± 0.06	0.18
	Pollination	0.75	-2.28 ± 0.29	2.51 ± 0.37	1.00	-0.12 ± 0.26	0.33	0.01 ± 0.14	0.19	0.02 ± 0.14	0.19
	Pest control	0.34	-1.18 ± 0.23	1.02 ± 0.32	1.00	-0.25 ± 0.35	0.48	0.64 ± 0.37	0.86	-0.39 ± 0.36	0.67
	Pest infestation	0.42	-2.47 ± 0.26	1.22 ± 0.32	1.00	-0.16 ± 0.28	0.38	0.13 ± 0.23	0.35	-0.05 ± 0.17	0.25
Socio-economic performance	Labour	0.16	-0.25 ± 0.16	0.13 ± 0.23	0.58	-0.20 ± 0.29	0.50	-0.09 ± 0.20	0.33	0.16 ± 0.23	0.45
	Semi-net margin	0.10	-0.37 ± 0.16	-0.08 ± 0.20	0.31	0.25 ± 0.31	0.55	-0.04 ± 0.16	0.24	0.01 ± 0.11	0.16
Agronomic performance	Yield	0.69	1.82 ± 0.19	-2.15 ± 0.26	1.00	0.45 ± 0.30	0.83	-0.20 ± 0.26	0.51	0.02 ± 0.10	0.20
c) 1000 m											
Multifunctionality index	0.22	-0.09 ± 0.07	0.27 ± 0.09	1.00	0.01 ± 0.05	0.21	-0.03 ± 0.08	0.35	-0.03 ± 0.07	0.31	
Ecological performance	Conservation	0.78	-0.83 ± 0.10	1.55 ± 0.14	1.00	-0.06 ± 0.12	0.35	0.31 ± 0.17	0.88	-0.03 ± 0.08	0.24
	Pollination	0.75	-2.25 ± 0.28	2.46 ± 0.36	1.00	0.02 ± 0.14	0.17	0.02 ± 0.13	0.16	-0.01 ± 0.13	0.16
	Pest control	0.27	-1.07 ± 0.22	0.88 ± 0.31	1.00	-0.14 ± 0.26	0.37	0.35 ± 0.35	0.64	-0.22 ± 0.31	0.48
	Pest infestation	0.39	-2.43 ± 0.25	1.15 ± 0.30	1.00	-0.05 ± 0.17	0.24	-0.01 ± 0.10	0.19	-0.05 ± 0.18	0.23
Socio-economic performance	Labour	0.11	-0.20 ± 0.13	0.18 ± 0.12	0.18	-0.02 ± 0.12	0.19	-0.04 ± 0.14	0.22	0.29 ± 0.29	0.67
	Semi-net margin	0.02	-0.40 ± 0.14	-0.02 ± 0.11	0.15	-0.01 ± 0.10	0.14	-0.01 ± 0.10	0.14	0.01 ± 0.11	0.14
Agronomic performance	Yield	0.67	1.71 ± 0.18	-1.98 ± 0.24	1.00	0.17 ± 0.23	0.48	-0.17 ± 0.23	0.48	-0.01 ± 0.11	0.22

44 **Table S9. Results from the model averaging procedure using linear models (LMs) of the**
 45 **effects of local farming system (conventional vs. organic) and landscape heterogeneity on**
 46 **the agroecosystem multifunctionality index (standardised using the z-score) and**
 47 **individual functions at three spatial scales.** Values in bold indicate significant effects (i.e.
 48 the confidence interval at 0.95 does not encompass the zero value). RI, relative importance of
 49 variables.
 50

	Pseudo R ² full model	Intercept Estimate ± SE	Local OF system Estimate ± SE	RI	% OF Estimate ± SE	RI	% SNH Estimate ± SE	RI	Hedgerow density Estimate ± SE	RI	
a) 250 m											
Multifunctionality	0.15	-0.03 ± 0.07	0.06 ± 0.10	0.42	0.04 ± 0.09	0.33	0.01 ± 0.05	0.18	0.12 ± 0.12	0.45	
Ecological performance	Conservation	0.76	-0.72 ± 0.11	1.45 ± 0.16	1.00	-0.16 ± 0.19	0.57	0.18 ± 0.18	0.66	0.03 ± 0.09	0.26
	Pollination	0.72	-0.83 ± 0.13	1.66 ± 0.19	1.00	-0.08 ± 0.15	0.32	0.05 ± 0.12	0.29	0.06 ± 0.13	0.37
	Pest control	0.27	-0.43 ± 0.22	0.87 ± 0.32	1.00	-0.26 ± 0.35	0.51	0.34 ± 0.35	0.63	0.01 ± 0.13	0.19
	Pest infestation	0.33	-0.41 ± 0.15	0.83 ± 0.22	1.00	-0.11 ± 0.20	0.39	0.08 ± 0.17	0.34	-0.08 ± 0.17	0.36
Socio-economic performance	Labour	0.04	-0.03 ± 0.19	0.06 ± 0.19	0.25	-0.04 ± 0.17	0.19	0.01 ± 0.12	0.12	-0.04 ± 0.16	0.19
	Semi-net margin	0.20	0.07 ± 0.20	-0.14 ± 0.27	0.35	0.74 ± 0.36	0.95	-0.04 ± 0.16	0.20	0.10 ± 0.23	0.44
Agronomic performance	Yield	0.70	0.82 ± 0.13	-1.64 ± 0.20	1.00	0.08 ± 0.17	0.33	-0.16 ± 0.20	0.51	0.01 ± 0.09	0.2
b) 500 m											
Multifunctionality	0.12	-0.04 ± 0.08	0.08 ± 0.11	0.46	0.06 ± 0.10	0.38	0.03 ± 0.08	0.26	-0.01 ± 0.05	0.16	
Ecological performance	Conservation	0.79	-0.74 ± 0.10	1.49 ± 0.15	1.00	-0.20 ± 0.20	0.65	0.33 ± 0.18	0.89	-0.01 ± 0.06	0.18
	Pollination	0.70	-0.84 ± 0.13	1.67 ± 0.19	1.00	-0.07 ± 0.15	0.34	0.01 ± 0.08	0.18	0.02 ± 0.09	0.20
	Pest control	0.38	-0.43 ± 0.19	0.87 ± 0.28	1.00	-0.13 ± 0.26	0.14	0.78 ± 0.29	1.00	-0.15 ± 0.25	0.41
	Pest infestation	0.35	-0.43 ± 0.15	0.85 ± 0.23	1.00	-0.19 ± 0.25	0.51	0.10 ± 0.19	0.40	-0.05 ± 0.13	0.28
Socio-economic performance	Labour	0.10	-0.03 ± 0.18	0.05 ± 0.19	0.22	-0.10 ± 0.24	0.31	-0.04 ± 0.17	0.20	0.06 ± 0.20	0.25
	Semi-net margin	0.08	0.01 ± 0.18	-0.03 ± 0.16	0.17	0.26 ± 0.35	0.50	-0.03 ± 0.16	0.17	-0.02 ± 0.14	0.16
Agronomic performance	Yield	0.75	0.90 ± 0.13	-1.80 ± 0.19	1.00	0.44 ± 0.25	0.88	-0.15 ± 0.20	0.50	0.01 ± 0.08	0.20
c) 1000 m											
Multifunctionality	0.13	-0.05 ± 0.08	0.11 ± 0.12	0.59	0.01 ± 0.05	0.21	0.04 ± 0.08	0.33	-0.03 ± 0.08	0.31	
Ecological performance	Conservation	0.76	-0.72 ± 0.10	1.43 ± 0.14	1.00	-0.05 ± 0.11	0.33	0.36 ± 0.14	1.00	-0.03 ± 0.09	0.28
	Pollination	0.70	-0.82 ± 0.13	1.64 ± 0.18	1.00	0.01 ± 0.08	0.17	0.01 ± 0.07	0.16	0.01 ± 0.07	0.15
	Pest control	0.32	-0.43 ± 0.20	0.86 ± 0.29	1.00	-0.11 ± 0.27	0.34	0.58 ± 0.34	0.88	-0.13 ± 0.24	0.35
	Pest infestation	0.29	0.05 ± 0.03	0.18 ± 0.05	1.00	-0.02 ± 0.04	0.34	-0.01 ± 0.02	0.18	-0.01 ± 0.02	0.21
Socio-economic performance	Labour	0.08	-0.01 ± 0.17	0.03 ± 0.14	0.17	-0.02 ± 0.14	0.16	-0.03 ± 0.15	0.17	0.23 ± 0.33	0.49
	Semi-net margin	0.01	0.01 ± 0.17	-0.01 ± 0.12	0.14	-0.02 ± 0.13	0.15	-0.02 ± 0.13	0.15	-0.01 ± 0.12	0.14
Agronomic performance	Yield	0.71	0.83 ± 0.13	-1.67 ± 0.19	1.00	0.16 ± 0.21	0.50	-0.19 ± 0.21	0.59	-0.01 ± 0.09	0.21



51

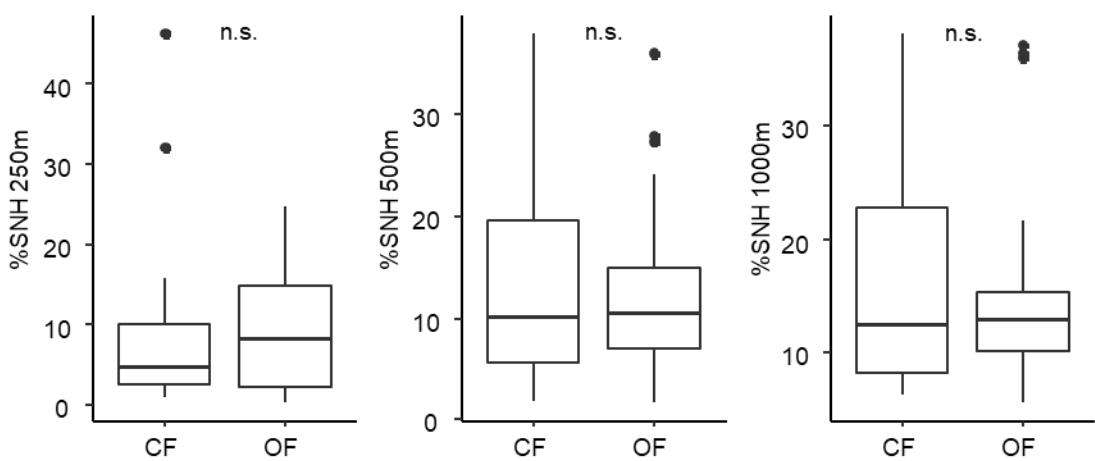
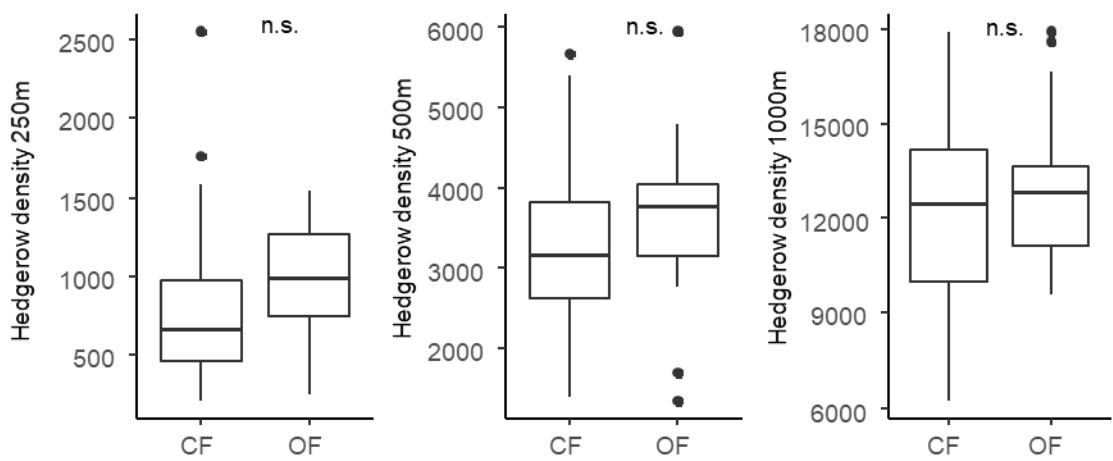
52

	N	Ntot
CF	16	20
OF Cereal crops	8	10
OF Mixed crops	9	10

53

54

55 **Figure S1. (a) Comparison of field size and management practices (number of crop**
 56 **interventions, treatment frequency index and nitrogen inputs) between conventional**
 57 **fields (CF), organic fields (OF) with cereal crops and organic fields (OF)**
 58 **with mixed crops. Differences were tested using analysis of variance (ANOVA) and Tukey's test for**
multiple comparisons ($*p < 0.001$; n.s., not significant). (b) Number of fields with**
ploughing (N) according to agricultural management. Ntot, total number of fields.

59
a)60
b)

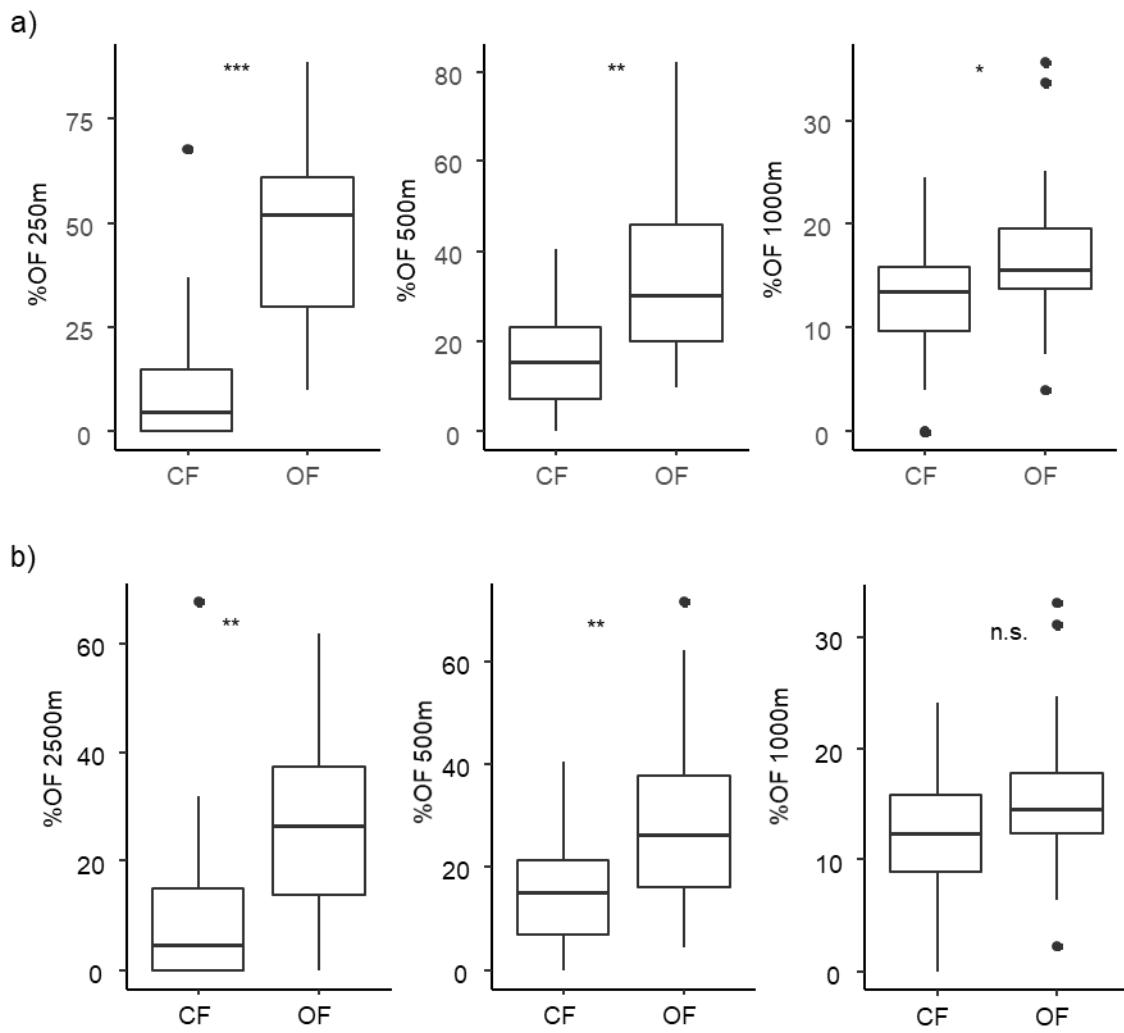
59

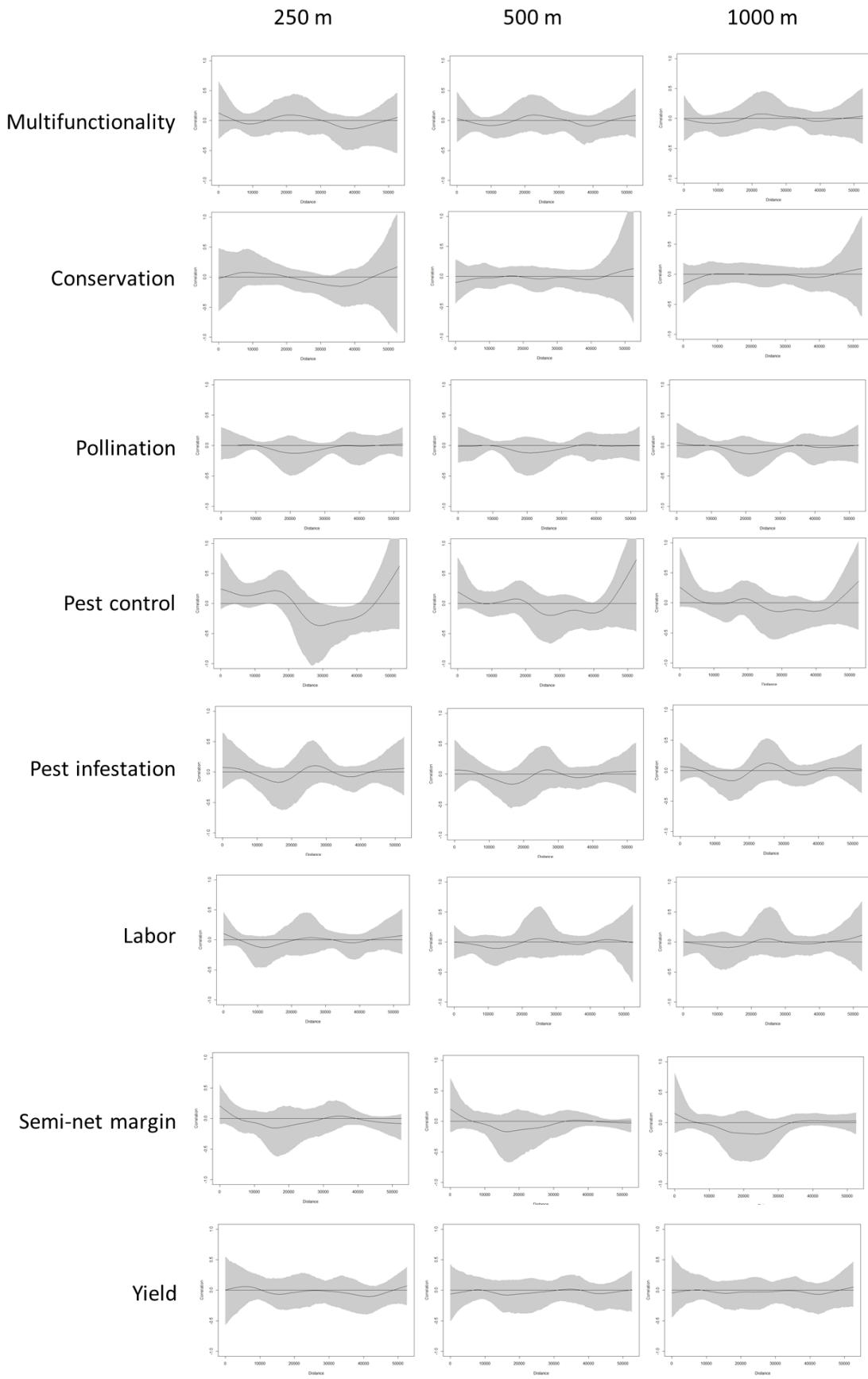
60 **Figure S2. (a) Percentage cover of semi-natural habitats (%SNH) and (b) hedgerow
61 density (ml) around studied fields according to local farming system (CF, conventional
62 farming; OF, organic farming) and spatial scales. No significant difference (n.s.) was
63 observed between CF and OF fields (Student t-test, $p > 0.05$).**

64

65

66 **Figure S3. Percentage cover of organic farming (%OF) within a 250, 500 and 1000 m
67 buffer radius around selected fields with (a) and without (b) taking into account the
68 focal field area.** Significant differences were tested using Student t-test (n.s., not significant;
69 * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$). Note that differences between CF and OF fields are
70 reduced without taking into account focal field area.





71

72 **Figure S4. Spatial correlograms (plotting Moran's I values against distance) of models**
 73 **resulting from the averaging procedure.** For details about models, see Table S8.

74 **Appendix S1. Details of arthropod sampling using the D-vac method**

75 Carabids, spiders, staphylinids, ladybird larvae and aphids were collected from each field and
76 each hedgerow using the vacuum method (D-vac). While pitfall traps are by far the most
77 commonly used method of sampling epigeic arthropods, other methods are available such as
78 suction samplers (McCravy, 2018). Suction methods have been found to be useful and even
79 more appropriate than pitfall trapping to sample a large panel of taxa, including natural
80 enemies such as carabids (e.g. Lafage & Pétillon, 2016; Amiar et al. submitted) as well as
81 pests located on both the vegetation and on the ground (Elliott et al., 2006; Yi et al., 2012;
82 Amiar et al. submitted). The most widely used suction sampler is the Dietrick vacuum insect
83 net, or D-vac. Although this method may underestimate the presence of large individuals
84 (e.g., *Carabidae* for carabid beetles and *Lycosidae* for spiders) (Elliott et al., 2006; Sanders
85 and Entling, 2011), it enables estimation of the absolute density of individuals and is
86 recommended when a representative sample of arthropods living on the soil surface and
87 within vegetation is required (Duffey, 1974).

88 By comparison, insect sampling with pitfall traps such as Barber pots tends to over-
89 represent large-bodied species in comparison with suction methods. The abundance of large
90 *Carabidae* and *Lycosidae* was found to be overestimated by pitfalls, while *Staphylinidae* and
91 *Linyphiidae* were underestimated (Lang, 2000). Thus, the presence of small mobile
92 individuals like agrobiont carabid species (e.g. *Trechus* sp.) which are known to contribute to
93 pest regulation (Vickerman and Sunderland, 1975) cannot be properly estimated with pitfall
94 traps, and suction methods appear to be more appropriate. Another disadvantage of pitfall
95 trapping is that it provides estimates of activity-densities rather than absolute densities, which
96 are thus dependent on vegetation density, climatic conditions, or the starvation state of
97 individuals.

98 In our study, the suction nozzle of the D-vac device (12.5 cm diameter) was placed on
99 the ground surface and we performed a series of five aspirations at 10-m intervals along two
100 transects (hedgerow and field). Each aspiration consisted of twenty 10-s aspirations (the time
101 necessary to sample all targeted arthropods according to Brook et al., 2008), covering a total
102 surface area of 0.24 m². The suction force was set to maximum. Arthropods were intercepted
103 with a polyester mesh (diameter 32 cm; depth 70 cm) placed within the D-vac nozzle.
104 Sampling was performed in May and June 2020. Samples were pooled by series and trapping
105 period. All individuals were stored in alcohol (70%) and counted in the laboratory.

106

107 **References**

- 108 Amiar, D., Leandro, C., Courtial, C., Pétillon, J. (submitted). A comparison of two widely-
109 used methods for estimating taxonomic and functional diversities of epigeal
110 arthropods in some temperate grasslands. *Entomologia Experimentalis et Applicata*.
- 111 Brook, A.J., Woodcock, B.A., Sinka, M., & Vanbergen, A.J. (2008). Experimental
112 verification of suction sampler capture efficiency in grasslands of differing vegetation

- height and structure. *Journal of Applied Ecology* 45, 1357–1363.
<https://doi.org/10.1111/j.1365-2664.2008.01530.x>
- Duffey, E. (1974). Comparative sampling methods for grassland spiders. *Bulletin of the British Arachnological Society* 3, 34–37.
- Elliott, N.C., Tao, F.L., Fuentes-Granados, R., Giles, K.L., Elliott, D.T., Greenstone, M.H., Shufran, K.A., & Royer, T.A. (2006). D-vac sampling for predatory arthropods in winter wheat. *Biological Control* 38, 325–330.
<https://doi.org/10.1016/j.biocontrol.2006.04.017>
- Lafage, D., & Pétillon, J. (2016). Relative importance of management and natural flooding on spider, carabid and plant assemblages in extensively used grasslands along the Loire. *Basic and Applied Ecology* 17(6), 535-545. <https://doi.org/10.1016/j.baae.2016.04.002>
- Lang, A. (2000). The pitfalls of pitfalls: a comparison of pitfall trap catches and absolute density estimates of epigaeal invertebrate predators in arable land. *Journal of Pest Science* 73, 99–106. <https://doi.org/10.1007/BF02956438>
- McCravy, K.W. (2018). A review of sampling and monitoring methods for beneficial arthropods in agroecosystems. *Insects* 9, 170. <https://doi.org/10.3390/insects9040170>
- Sanders, D., & Entling, M.H. (2011). Large variation of suction sampling efficiency depending on arthropod groups, species traits, and habitat properties: Variation in arthropod suction sampling. *Entomologia Experimentalis et Applicata* 138, 234–243.
<https://doi.org/10.1111/j.1570-7458.2010.01094.x>
- Vickerman, G. P., & Sunderland, K. D. (1975). Arthropods in cereal crops: nocturnal activity, vertical distribution and aphid predation. *Journal of applied Ecology* 12(3), 755-766.
<https://doi.org/10.2307/2402088>
- Yi, Z., Jinchao, F., Dayuan, X., Weiguo, S., & Axmacher, J. C. (2012). A comparison of terrestrial arthropod sampling methods. *Journal of Resources and Ecology* 3(2), 174-182. <https://doi.org/10.5814/j.issn.1674-764x.2012.02.010>

139