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## Supplementary information

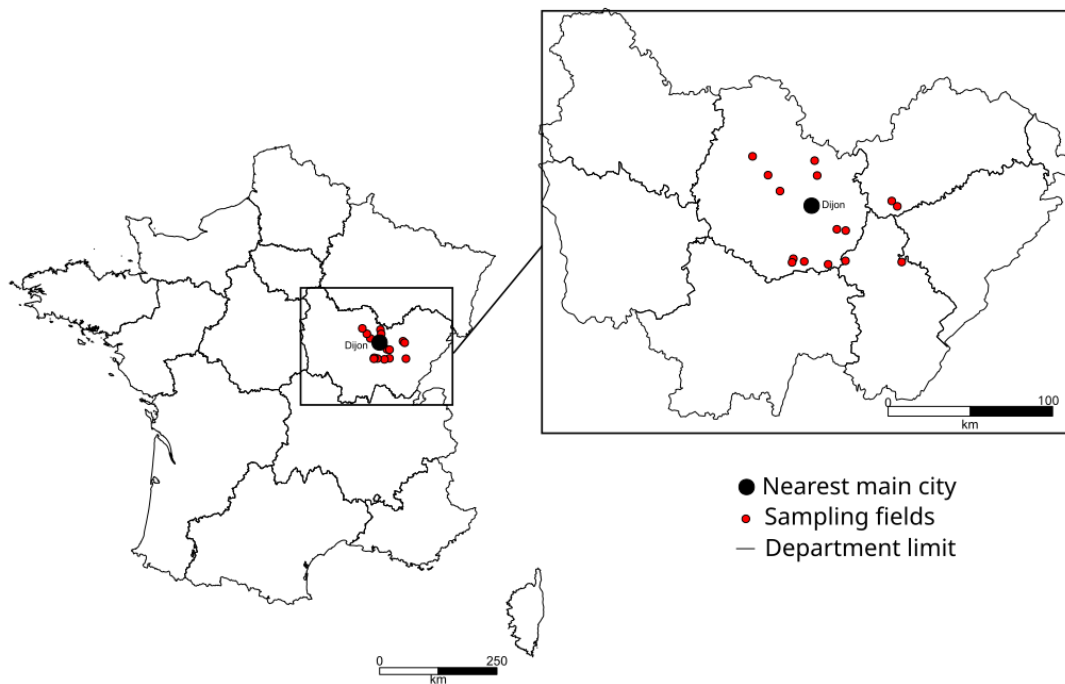
### **Conservation agriculture affects the multitrophic interactions driving the efficacy of weed biological control.**

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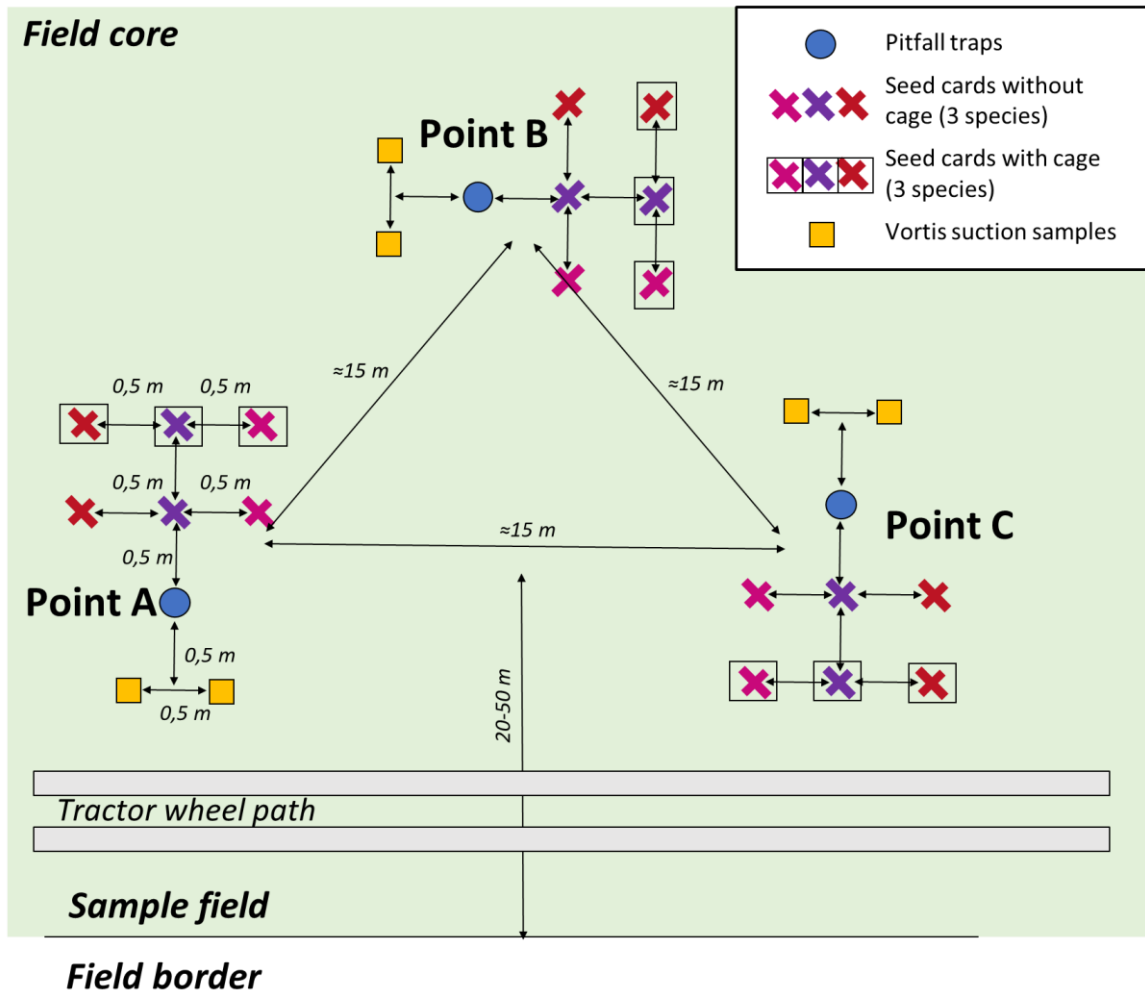
15 **Figure S1:** Location of the 15 sampling field pairs at the Bourgogne-Franche-Comté region  
16 scale. The map was generated using R version 4.0.5 (R Core Team, 2022) and the package  
17 “raster” (Hijmans et al., 2021).

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19 **Table S1:** Descriptive statistics (mean (standard deviation) and [minimum, maximum])) of the  
 20 fields sampled in conventional agriculture (N=14), soil conservation agriculture (N=15) and all  
 21 fields combined (N=29). We detailed information about field size, tillage (depth, number of  
 22 passages), sowing (density, spacing), pesticide applications (number of passages), fertilisation  
 23 (number of passages) and yield.

		<b>Conventional agriculture (N=14)</b>	<b>Soil conservation agriculture (N=15)</b>	<b>Total (N=29)</b>
<b>Field surface (ha)</b>	Mean (SD) [min; max]	12.18 (9.74) [0.08; 31]	10.21 (9.54) [0.08; 39.34]	11.16 (9.51) [0.08; 39.34]
<b>Tillage</b>				
<b>Depth (cm)</b>	Mean (SD) [min; max]	9.25 (5.93) [0; 25]	0 (0) [0; 0]	7.86 (6.4) [0; 25]
<b>Number of passages</b>	Mean (SD) [min; max]	2.79 (1.53) [1; 6]	0.4 (0.91) [0; 3]	1.55 (1.72) [0; 6]
<b>Sowing</b>				
<b>Density (seed/m<sup>2</sup>)</b>	Mean (SD) [min; max]	369.43 (42.64) [300; 444]	340.26 (41.15) [254; 400]	354.34 (43.71) [254; 444]
<b>Spacing (cm)</b>	Mean (SD) [min; max]	14.58 (3.72) [11; 25]	18.43 (3.04) [15; 25]	16.72 (3.8) [11; 25]
<b>Pesticide (number of passages)</b>				
<b>Fongicide</b>	Mean (SD) [min; max]	3.29 (1.44) [1; 6]	2.8 (1.42) [1; 6]	3.03 (1.43) [1; 6]
<b>Herbicide</b>	Mean (SD) [min; max]	3.07 (1.38) [1; 6]	5.26 (3.1) [2; 13]	4.21 (2.64) [1; 13]
<b>Insecticide</b>	Mean (SD) [min; max]	0.64 (0.63) [0; 2]	1.06 (1.03) [0; 4]	0.86 (0.87) [0; 4]
<b>Fertilisation (number of passages)</b>	Mean (SD) [min; max]	5.36 (2.34) [3; 11]	5.66 (3.06) [2; 13]	5.52 (2.69) [2; 13]
<b>Yield (qx/ha)</b>	Mean (SD) [min; max]	69.43 (12.06) [52; 87.8]	70.58 (12.74) [48; 89]	70.02 (12.20) [48; 89]

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26 **Figure S2:** Schematic representation of the sampling plan of a field with the location of the  
 27 three sampling points with pitfall traps, seed cards (with and without cage) and suction  
 28 samples.

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30 **Table S2:** Spearman correlations between the percentage of different types of land use in a 1  
 31 km radius buffer around the sampled fields. For each correlation, we indicated the level of  
 32 significance using: \*  $P < 0.05$ ; \*\*  $P < 0.01$ ; \*\*\*  $P < 0.001$ .

	Annual crop	Perennial crop	Permanent grassland	Temporary grassland	Woody habitats	Organic agriculture	Conventional agriculture	Soil conservation agriculture
Annual crop		0.08	<b>-0.83***</b>	<b>-0.55**</b>	<b>-0.40*</b>	-0.24	-0.08	-0.03
Perennial crop			-0.02	-0.18	-0.03	-0.27	0.2	0.00
Permanent grassland				0.16	0.09	0.09	0.04	0.02
Temporary grassland					0.21	<b>0.45*</b>	0.17	-0.09
Woody habitats						0.15	-0.08	0.14
Organic agriculture							<b>0.54**</b>	-0.16
Conventional agriculture								-0.02
Soil conservation agriculture								

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35 **Table S3:** Descriptive statistics (mean (standard deviation) and median [minimum, maximum])  
 36 of the variables measured per field according to the sampled session (May, June). We detailed  
 37 invertebrate seed predation, total seed predation, granivorous and omnivorous activity-  
 38 density, rodent and shrew abundance, spider abundance, and animal and plant resource  
 39 indexes.

	May session (N=30)	June session (N=30)
<b>Invertebrate seed predation (with cage)</b>		
Mean (SD)	0.472 (0.261)	0.488 (0.219)
Median [Min; Max]	0.489 [0.0556; 0.950]	0.456 [0.0722; 0.911]
<b>Total seed predation (without cage)</b>		
Mean (SD)	0.676 (0.229)	0.770 (0.195)
Median [Min; Max]	0.647 [0.161; 0.994]	0.775 [0.167; 0.972]
<b>Granivorous carabids</b>		
Mean (SD)	45.7 (73.2)	40.6 (81.2)
Median [Min; Max]	12.0 [0; 351]	13.0 [0; 395]
<b>Omnivorous carabids</b>		
Mean (SD)	40.1 (51.3)	21.1 (25.7)
Median [Min; Max]	21.0 [1.00; 230]	8.50 [0; 95.0]
<b>Rodent</b>		
Mean (SD)	NA	4.10 (5.67)
Median [Min; Max]	NA	2.00 [0; 27.0]
<b>Shrew</b>		
Mean (SD)	NA	0.600 (1.19)
Median [Min; Max]	NA	0 [0; 6.00]
<b>Spider</b>		
Mean (SD)	19.6 (17.6)	13.7 (13.5)
Median [Min; Max]	16.5 [3.00; 88.0]	10.5 [0; 62.0]
<b>Animal resources</b>		
Mean (SD)	NA	1.90 (0.508)
Median [Min; Max]	NA	2.03 [0.816; 2.65]
<b>Plant resources</b>		
Mean (SD)	NA	0.663 (0.352)
Median [Min; Max]	NA	0.640 [0.133; 1.74]

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41 **Table S4.** Description of the omnivorous and granivorous carabid species trapped (30 fields) for the May and June sessions. The main source for  
 42 trophic guilds is Homburg et al., 2014. We detailed field occurrence (number of fields with presence and the corresponding percentage), total  
 43 activity-density (AD) (total number of individuals and the corresponding percentage), the mean (standard deviation) and median [minimum,  
 44 maximum] AD per field.

Trophic group	Species	May session (N=30)				June session (N=30)			
		Field occurrence (nb and %)	Total AD (%)	Mean AD (SD)	Median AD [Min, Max]	Field occurrence (nb and %)	Total AD (%)	Mean AD (SD)	Median AD [Min, Max]
Omnivorous carabids	<i>Acupalpus meridianus</i>	1 (3.33%)	1 (0.04%)	0.03 (0.18)	0 [0; 1]	2 (6.67%)	3 (0.16%)	0.1 (0.4)	0 [0; 2]
	<i>Agonum muelleri</i>	4 (13.33%)	24 (0.93%)	0.8 (3.2)	0 [0; 17]	4 (13.33%)	28 (1.51%)	0.93 (2.68)	0 [0; 10]
	<i>Calathus fuscipes</i>	5 (16.67%)	15 (0.58%)	0.5 (1.61)	0 [0; 8]	1 (3.33%)	2 (0.11%)	0.07 (0.37)	0 [0; 2]
	<i>Gynandromorphus etruscus</i>	0 (0%)	0 (0%)	0 (0)	0 [0; 0]	3 (10%)	5 (0.27%)	0.17 (0.53)	0 [0; 2]
	<i>Poecilus cupreus</i>	30 (100%)	1043 (40.52%)	34.77 (49.66)	14 [1; 225]	26 (86.67%)	505 (27.31%)	16.83 (22.59)	7.5 [0; 87]
	<i>Pterostichus melanarius</i>	16 (53.33%)	77 (2.99%)	2.57 (4.2)	1 [0; 16]	11 (36.67%)	52 (2.81%)	1.73 (3.96)	0 [0; 19]
	<i>Trechus quadristriatus</i>	11 (36.67%)	44 (1.71%)	1.47 (2.97)	0 [0; 13]	13 (43.33%)	37 (2%)	1.23 (2.36)	0 [0; 9]
	<b>Total omnivorous carabids</b>	<b>30 (100%)</b>	<b>1204 (46.78%)</b>	<b>40.13 (51.34)</b>	<b>21 [1; 230]</b>	<b>28 (93.33%)</b>	<b>632 (34.18%)</b>	<b>21.07 (25.69)</b>	<b>8.5 [0; 95]</b>
Granivorous carabids	<i>Amara aenea</i>	1 (3.33%)	1 (0.04%)	0.03 (0.18)	0 [0; 1]	0 (0%)	0 (0%)	0 (0)	0 [0; 0]
	<i>Amara consularis</i>	0 (0%)	0 (0%)	0 (0)	0 [0; 0]	2 (6.67%)	2 (0.11%)	0.07 (0.25)	0 [0; 1]
	<i>Amara familiaris</i>	0 (0%)	0 (0%)	0 (0)	0 [0; 0]	1 (3.33%)	1 (0.05%)	0.03 (0.18)	0 [0; 1]
	<i>Amara ovata</i>	1 (3.33%)	1 (0.04%)	0.03 (0.18)	0 [0; 1]	0 (0%)	0 (0%)	0 (0)	0 [0; 0]
	<i>Amara similata</i>	4 (13.33%)	5 (0.19%)	0.17 (0.46)	0 [0; 2]	1 (3.33%)	1 (0.05%)	0.03 (0.18)	0 [0; 1]
	<i>Anisodactylus signatus</i>	2 (6.67%)	41 (1.59%)	1.37 (7.12)	0 [0; 39]	2 (6.67%)	18 (0.97%)	0.6 (3.1)	0 [0; 17]
	<i>Harpalus affinis</i>	29 (96.67%)	442 (17.17%)	14.73 (18.35)	7.5 [0; 72]	25 (83.33%)	265 (14.33%)	8.83 (13.51)	2.5 [0; 54]
	<i>Harpalus atratus</i>	1 (3.33%)	1 (0.04%)	0.03 (0.18)	0 [0; 1]	0 (0%)	0 (0%)	0 (0)	0 [0; 0]
	<i>Harpalus dimidiatus</i>	19 (63.33%)	346 (13.44%)	11.53 (23.71)	3 [0; 94]	22 (73.33%)	255 (13.79%)	8.5 (15.86)	2 [0; 68]
	<i>Harpalus distinguendus</i>	6 (20%)	486 (18.88%)	16.2 (53.91)	0 [0; 264]	8 (26.67%)	565 (30.56%)	18.83 (61.41)	0 [0; 296]
	<i>Harpalus honestus</i>	1 (3.33%)	3 (0.12%)	0.1 (0.55)	0 [0; 3]	0 (0%)	0 (0%)	0 (0)	0 [0; 0]
	<i>Harpalus latus</i>	1 (3.33%)	1 (0.04%)	0.03 (0.18)	0 [0; 1]	0 (0%)	0 (0%)	0 (0)	0 [0; 0]
	<i>Harpalus rubripes</i>	1 (3.33%)	1 (0.04%)	0.03 (0.18)	0 [0; 1]	0 (0%)	0 (0%)	0 (0)	0 [0; 0]
	<i>Pseudoophonus rufipes</i>	10 (33.33%)	35 (1.36%)	1.17 (2.31)	0 [0; 8]	17 (56.67%)	106 (5.73%)	3.53 (6.89)	1 [0; 30]
	<i>Harpalus tardus</i>	1 (3.33%)	1 (0.04%)	0.03 (0.18)	0 [0; 1]	0 (0%)	0 (0%)	0 (0)	0 [0; 0]
	<i>Ophonus azureus</i>	0 (0%)	0 (0%)	0 (0)	0 [0; 0]	2 (6.67%)	2 (0.11%)	0.07 (0.25)	0 [0; 1]
	<i>Scybalicus oblongiusculus</i>	1 (3.33%)	1 (0.04%)	0.03 (0.18)	0 [0; 1]	1 (3.33%)	1 (0.05%)	0.03 (0.18)	0 [0; 1]
<i>Semiophonus signaticornis</i>	2 (6.67%)	5 (0.19%)	0.17 (0.75)	0 [0; 4]	1 (3.33%)	1 (0.05%)	0.03 (0.18)	0 [0; 1]	
<b>Total granivorous carabids</b>	<b>29 (96.67%)</b>	<b>1370 (53.22%)</b>	<b>45.67 (73.17)</b>	<b>12 [0; 351]</b>	<b>29 (96.67%)</b>	<b>1217 (65.82%)</b>	<b>40.57 (81.17)</b>	<b>13 [0; 395]</b>	

46 **Figure S3:** Photographs of INRA small mammal traps set between the cereal rows. For more  
 47 details see: Le Quilliec & Croci (2006).



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54 **Table S5.** Description of the trapped micromammals (30 fields). We indicated the trophic  
 55 group, the field occurrence (number of fields with presence and the corresponding  
 56 percentage), total abundance (total number of individuals and the corresponding percentage)  
 57 and the mean (standard deviation) and median [minimum, maximum] abundance per field.

Trophic group	Common name	Species	Field occurrence (number and %)	Total abundance (%)	Mean abundance (SD)	Median abundance [Min, Max]
Rodent	Field Vole	<i>Microtus</i> sp.	15 (50%)	84 (59.57%)	3.23 (5.72)	1 [0, 25]
	Field Mice	<i>Apodemus</i> sp.	13 (43.3%)	39 (27.67%)	1.5 (1.98)	0.5 [0, 8]
	Total rodents		22 (73.3%)	123 (87.24%)	4.73 (5.84)	3 [0, 27]
Insectivore	Shrews	<i>Crocidura</i> sp.	11 (36.66%)	18 (12.76%)	0.69 (1.26)	0 [0, 6]

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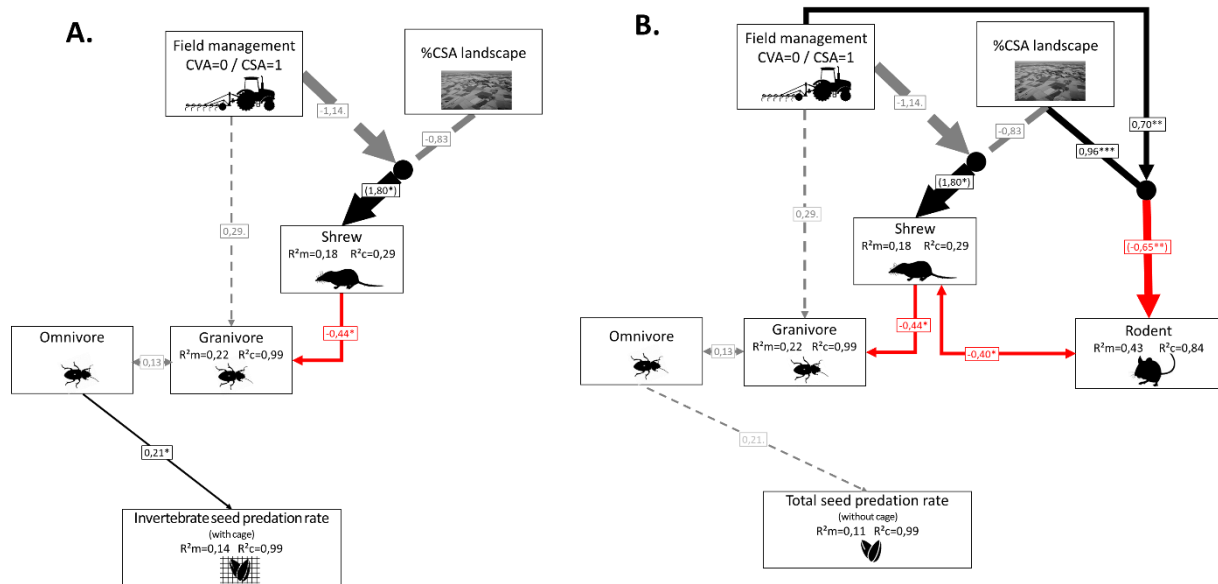
60 **Table S6.** Description of the spiders trapped (30 fields) likely to consume carabids for the May and June sessions. We detailed field occurrence  
 61 (number of fields with presence and the corresponding percentage), total activity-density (AD) (total number of individuals and the corresponding  
 62 percentage), the mean (standard deviation) and median [minimum, maximum] AD per field.

Species	May session (N=30)				June session (N=30)			
	Field occurrence (nb and %)	Total AD (%)	Mean AD (SD)	Median AD [Min, Max]	Field occurrence (nb and %)	Total AD (%)	Mean AD (SD)	Median AD [Min, Max]
<i>Alopecosa accentuata</i>	1 (3.33%)	3 (0.51%)	0.1 (0.55)	0 [0; 3]	0 (0%)	0 (0%)	0 (0)	0 [0; 0]
<i>Alopecosa cuneata</i>	1 (3.33%)	1 (0.17%)	0.03 (0.18)	0 [0; 1]	2 (6.67%)	2 (0.49%)	0.07 (0.25)	0 [0; 1]
<i>Alopecosa farinosa</i>	7 (23.33%)	17 (2.9%)	0.57 (1.36)	0 [0; 6]	2 (6.67%)	4 (0.97%)	0.13 (0.51)	0 [0; 2]
<i>Alopecosa pulverulenta</i>	2 (6.67%)	3 (0.51%)	0.1 (0.4)	0 [0; 2]	0 (0%)	0 (0%)	0 (0)	0 [0; 0]
<i>Apostenus fuscus</i>	1 (3.33%)	1 (0.17%)	0.03 (0.18)	0 [0; 1]	0 (0%)	0 (0%)	0 (0)	0 [0; 0]
<i>Arctosa leopardus</i>	0 (0%)	0 (0%)	0 (0)	0 [0; 0]	1 (3.33%)	1 (0.24%)	0.03 (0.18)	0 [0; 1]
<i>Drassyllus lutetianus</i>	2 (6.67%)	3 (0.51%)	0.1 (0.4)	0 [0; 2]	10 (33.33%)	25 (6.08%)	0.83 (1.82)	0 [0; 8]
<i>Drassyllus pumilus</i>	3 (10%)	7 (1.19%)	0.23 (0.77)	0 [0; 3]	3 (10%)	5 (1.22%)	0.17 (0.59)	0 [0; 3]
<i>Drassyllus pusillus</i>	19 (63.33%)	71 (12.1%)	2.37 (2.68)	1,5 [0; 9]	12 (40%)	21 (5.11%)	0.7 (1.09)	0 [0; 4]
<i>Haplodrassus dalmatensis</i>	4 (13.33%)	17 (2.9%)	0.57 (2.56)	0 [0; 14]	8 (26.67%)	33 (8.03%)	1.1 (2.84)	0 [0; 14]
<i>Haplodrassus signifer</i>	13 (43.33%)	28 (4.77%)	0.93 (1.28)	0 [0; 4]	8 (26.67%)	9 (2.19%)	0.3 (0.53)	0 [0; 2]
<i>Pardosa agrestis</i>	10 (33.33%)	111 (18.91%)	3.7 (10.22)	0 [0; 53]	12 (40%)	76 (18.49%)	2.53 (6.88)	0 [0; 35]
<i>Pardosa amentata</i>	0 (0%)	0 (0%)	0 (0)	0 [0; 0]	1 (3.33%)	2 (0.49%)	0.07 (0.37)	0 [0; 2]
<i>Pardosa hortensis</i>	4 (13.33%)	6 (1.02%)	0.2 (0.55)	0 [0; 2]	1 (3.33%)	1 (0.24%)	0.03 (0.18)	0 [0; 1]
<i>Pardosa palustris</i>	12 (40%)	21 (3.58%)	0.7 (1.39)	0 [0; 7]	8 (26.67%)	14 (3.41%)	0.47 (0.97)	0 [0; 4]
<i>Pardosa prativaga</i>	18 (60%)	70 (11.93%)	2.33 (3.12)	1 [0; 12]	19 (63.33%)	102 (24.82%)	3.4 (5.94)	1 [0; 28]
<i>Pardosa pullata</i>	3 (10%)	3 (0.51%)	0.1 (0.31)	0 [0; 1]	0 (0%)	0 (0%)	0 (0)	0 [0; 0]
<i>Pardosa saltans</i>	4 (13.33%)	4 (0.68%)	0.13 (0.35)	0 [0; 1]	1 (3.33%)	1 (0.24%)	0.03 (0.18)	0 [0; 1]
<i>Pardosa sp</i>	20 (66.67%)	39 (6.64%)	1.3 (1.8)	1 [0; 9]	4 (13.33%)	8 (1.95%)	0.27 (0.83)	0 [0; 4]
<i>Pardosa tenuipes</i>	5 (16.67%)	6 (1.02%)	0.2 (0.48)	0 [0; 2]	1 (3.33%)	1 (0.24%)	0.03 (0.18)	0 [0; 1]
<i>Trochosa ruricola</i>	13 (43.33%)	29 (4.94%)	0.97 (1.4)	0 [0; 5]	12 (40%)	37 (9%)	1.23 (2.01)	0 [0; 7]
<i>Trochosa sp</i>	4 (13.33%)	4 (0.68%)	0.13 (0.35)	0 [0; 1]	4 (13.33%)	5 (1.22%)	0.17 (0.46)	0 [0; 2]
<i>Trochosa spinipalpis</i>	0 (0%)	0 (0%)	0 (0)	0 [0; 0]	1 (3.33%)	2 (0.49%)	0.07 (0.37)	0 [0; 2]
<i>Trochosa terricola</i>	2 (6.67%)	2 (0.34%)	0.07 (0.25)	0 [0; 1]	0 (0%)	0 (0%)	0 (0)	0 [0; 0]
<i>Xerolycosa nemoralis</i>	0 (0%)	0 (0%)	0 (0)	0 [0; 0]	1 (3.33%)	1 (0.24%)	0.03 (0.18)	0 [0; 1]
<i>Xerolycosa sp</i>	2 (6.67%)	8 (1.36%)	0.27 (1.01)	0 [0; 4]	1 (3.33%)	1 (0.24%)	0.03 (0.18)	0 [0; 1]
<i>Xysticus acerbus</i>	2 (6.67%)	3 (0.51%)	0.1 (0.4)	0 [0; 2]	0 (0%)	0 (0%)	0 (0)	0 [0; 0]
<i>Xysticus cf. kochi</i>	1 (3.33%)	1 (0.17%)	0.03 (0.18)	0 [0; 1]	0 (0%)	0 (0%)	0 (0)	0 [0; 0]
<i>Xysticus cristatus</i>	3 (10%)	5 (0.85%)	0.17 (0.59)	0 [0; 3]	0 (0%)	0 (0%)	0 (0)	0 [0; 0]
<i>Xysticus kochi</i>	20 (66.67%)	114 (19.42%)	3.8 (5.25)	1 [0; 19]	9 (30%)	60 (14.6%)	2 (4.56)	0 [0; 17]
<i>Xysticus sp</i>	8 (26.67%)	10 (1.7%)	0.33 (0.61)	0 [0; 2]	0 (0%)	0 (0%)	0 (0)	0 [0; 0]
<b>Total</b>	<b>30 (100%)</b>	<b>587 (100%)</b>	<b>19.57 (17.64)</b>	<b>16.5 [3; 88]</b>	<b>29 (96.67%)</b>	<b>411 (100%)</b>	<b>13.7 (13.53)</b>	<b>10.5 [0; 62]</b>

64 **Table S7.** Description of the trophic resources collected (30 fields) for the June sampling  
 65 session. We indicated the field occurrence (number of fields with presence and the  
 66 corresponding percentage), total abundance, mean (standard deviation) and median  
 67 [minimum, maximum] abundance per field.

Resources	Taxa	Field occurrence number (%)	Total abundance	Mean abundance (SD)	Median abundance [Min; Max]
Animal	<b>Collembola</b>	<b>30 (100%)</b>	<b>21047</b>	<b>702 (492)</b>	<b>583 [38.0; 2250]</b>
	<b>Aphididae</b>	<b>30 (100%)</b>	<b>2376</b>	<b>79.2 (80.7)</b>	<b>65.0 [1.00; 391]</b>
	<b>Total earthworm</b>	<b>28 (93.3%)</b>	<b>270</b>	<b>9 (8.22)</b>	<b>7.5 [0; 38]</b>
	strict-aneic	28 (93.3%)	203	6.76 (6.40)	5 [0; 32]
	epi-aneic	17 (56.6%)	65	2.16 (3.04)	1 [0; 11]
	epigeneous	2 (6.6%)	2	0.06 (0.25)	0 [0; 1]
	<b>Animal resource index</b>	<b>30 (100%)</b>	<b>51.85</b>	<b>1.73 (0.48)</b>	<b>1.71 [0.44; 2.63]</b>
Vegetal	<b>Total weed seed</b>	<b>24 (80%)</b>	<b>321</b>	<b>10.7 (32.55)</b>	<b>2.5 [0; 180]</b>
	<i>Alopecurus myosuroides</i>	10 (33.33%)	184	6.13 (31.7)	0 [0; 174]
	<i>Amaranthus retroflexus</i>	6 (20%)	28	0.93 (2.50)	0 [0; 12.0]
	<i>Chenopodium album</i>	5 (16.67%)	26	0.86 (2.91)	0 [0; 15.0]
	Other dicotyledonous	11 (36.67%)	21	0.70 (1.32)	0 [0; 6.00]
	Poaceae	10 (33.33%)	15	0.50 (0.82)	0 [0; 3.00]
	<i>Fallopia convolvulus</i>	3 (10%)	10	0.33 (1.47)	0 [0; 8.00]
	<i>Amaranthus</i> sp.	5 (16.67%)	7	0.23 (0.56)	0 [0; 2.00]
	<i>Capsella bursa-pastoris</i>	3 (10%)	6	0.20 (0.76)	0 [0; 4.00]
	<i>Fagopyrum esculentum</i>	1 (3.33%)	5	0.16 (0.91)	0 [0; 5.00]
	<i>Polygonum aviculare</i>	3 (10%)	5	0.16 (0.59)	0 [0; 3.00]
	<i>Geranium</i> sp.	3 (10%)	3	0.10 (0.30)	0 [0; 1.00]
	<i>Polygonum</i> sp.	3 (10%)	3	0.10 (0.30)	0 [0; 1.00]
	<i>Lysimachia arvensis</i>	1 (3.33%)	1	0.03 (0.183)	0 [0; 1.00]
	Asteraceae	1 (3.33%)	1	0.03 (0.183)	0 [0; 1.00]
	<i>Euphorbia</i> sp.	1 (3.33%)	1	0.03 (0.183)	0 [0; 1.00]
	<i>Plantago lanceolata</i>	1 (3.33%)	1	0.03 (0.183)	0 [0; 1.00]
	<i>Solanum nigrum</i>	1 (3.33%)	1	0.03 (0.183)	0 [0; 1.00]
	<i>Stellaria media</i>	1 (3.33%)	1	0.03 (0.183)	0 [0; 1.00]
	<i>Thlaspi arvense</i>	1 (3.33%)	1	0.03 (0.183)	0 [0; 1.00]
	<i>Verbena officinalis</i>	1 (3.33%)	1	0.03 (0.183)	0 [0; 1.00]
	<b>Total weeds (flowering. fructification)</b>	<b>21 (70%)</b>	<b>74.25</b>	<b>2.47 (2.63)</b>	<b>1.5 [0; 10.7]</b>
	<i>Alopecurus myosuroides</i>	14 (46.67%)	34.75	1.16 (1.60)	0 [0; 5.00]
	<i>Lolium perenne</i>	8 (26.67%)	16	0.53 (1.14)	0 [0; 5.00]
	<i>Galium aparine</i>	4 (13.33%)	3.5	0.11 (0.31)	0 [0; 1.25]
	<i>Anisantha sterilis</i>	2 (6.67%)	2.5	0.08 (0.31)	0 [0; 1.25]
	<i>Avena fatua</i>	2 (6.67%)	2	0.06 (0.26)	0 [0; 1.25]
	<i>Chaenorrhinum minus</i>	1 (3.33%)	1.25	0.04 (0.22)	0 [0; 1.25]
	<i>Geranium dissectum</i>	1 (3.33%)	1.25	0.04 (0.22)	0 [0; 1.25]
	<i>Papaver rhoeas</i>	1 (3.33%)	1.25	0.04 (0.22)	0 [0; 1.25]
	<i>Poa annua</i>	1 (3.33%)	1.25	0.04 (0.22)	0 [0; 1.25]
	<i>Poa trivialis</i>	1 (3.33%)	1.25	0.04 (0.22)	0 [0; 1.25]
	<i>Veronica persica</i>	1 (3.33%)	1.25	0.04 (0.22)	0 [0; 1.25]
	<i>Vicia cracca</i>	1 (3.33%)	1.25	0.04 (0.22)	0 [0; 1.25]
	<i>Bromus hordeaceus</i>	1 (3.33%)	0.75	0.02 (0.13)	0 [0; 0.75]
<i>Fumaria officinalis</i>	1 (3.33%)	0.75	0.02 (0.13)	1 [0; 0.75]	
<i>Matricaria chamomilla</i>	1 (3.33%)	0.75	0.02 (0.13)	2 [0; 0.75]	
<i>Scandix pecten-veneris</i>	1 (3.33%)	0.75	0.02 (0.13)	3 [0; 0.75]	
<i>Secale cereale</i>	1 (3.33%)	0.75	0.02 (0.13)	4 [0; 0.75]	
<i>Silene latifolia</i> subsp. <i>Alba</i>	1 (3.33%)	0.75	0.02 (0.13)	5 [0; 0.75]	
<i>Sinapis arvensis</i>	1 (3.33%)	0.75	0.02 (0.13)	6 [0; 0.75]	
<i>Sinapis</i> sp.	1 (3.33%)	0.75	0.02 (0.13)	7 [0; 0.75]	
<i>Veronica hederifolia</i>	1 (3.33%)	0.75	0.02 (0.13)	8 [0; 0.75]	
<b>Plant resource index</b>	<b>27 (90%)</b>	<b>14.47</b>	<b>0.48 (0.43)</b>	<b>0.43 [0; 2]</b>	

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70 **Figure S4:** SEMs for the May sampling session including cascading effects of ‘Field  
 71 management’ (CVA: conventional and CSA: conservation agriculture) in interaction with the  
 72 ‘%CSA landscape’ (the proportion of conservation agriculture in the landscape) on (A)  
 73 invertebrate and (B) total weed seed predation. The black and red arrows denote significant  
 74 positive and negative effects, respectively. The grey dotted arrows indicate non-significant  
 75 effects. The bidirectional arrows show no causal correlations between variables. The black  
 76 circles (●) show two-way interactions. Standardised coefficients are shown for all paths. The  
 77 numbers in parentheses show the interaction coefficients. The numbers of asterisks indicate  
 78 the level of significance (.  $p < 0.1$ , \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ ).

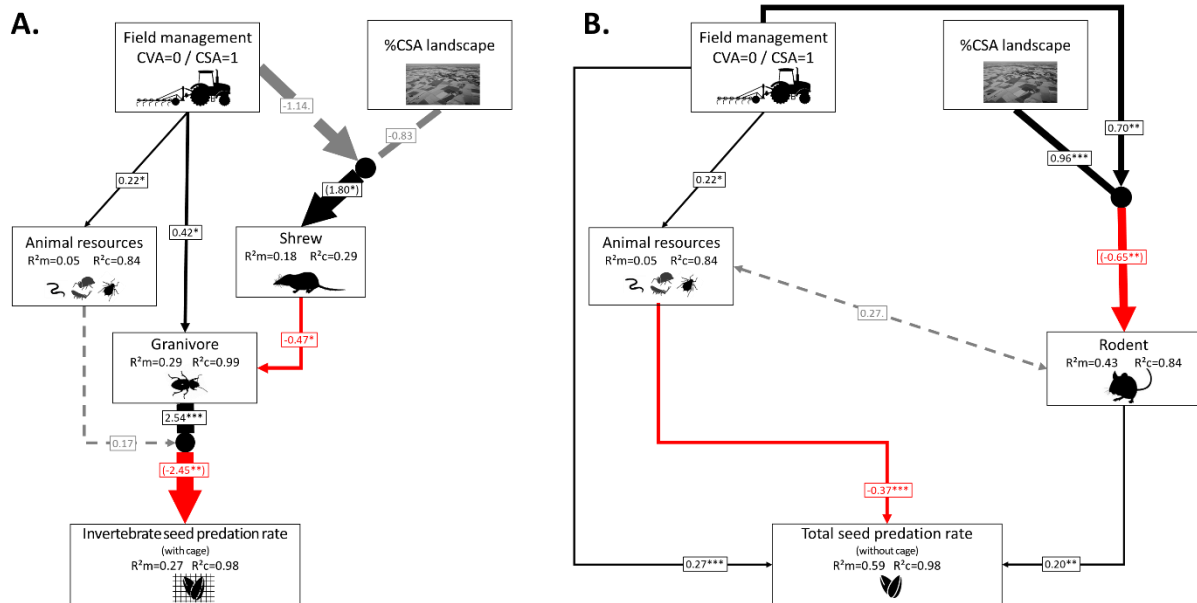
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81 **Table S8:** Parameter estimates from SEMs for the May sampling session. The response  
 82 variables were distinguished according to whether they were present in both SEMs or only  
 83 one of the two SEMs. For each response variable, we reported marginal ( $R^2_m$ ) and conditional  
 84 ( $R^2_c$ ) r-squared. For each predictor with reported unscale estimate, standard error (SE), the  
 85 critical ratio value (Crit. Value), the P-value and the standardized estimate (Stand. coefficient).  
 86 The highlighted are predictors with  $p \leq 0.05$ . Numbers of asterisks indicate the level of  
 87 significance ( $p < 0.1$ ,  $*p < 0.05$ ,  $**p < 0.01$ ,  $***p < 0.001$ ). The SEM for invertebrate (Fisher's  
 88  $C = 19.33$ ,  $P = 0.153$ ) and total seed predation (Fisher's  $C = 13.97$ ,  $P = 0.731$ ) represented our  
 89 data well.

SEM	Response	$R^2_m$	$R^2_c$	Predictor	Unscale estimate	SE	DF	Crit. Value	p	Scaled estimate
Common to both SEMs	Shrews	0.18	0.29	Field management	-2.572	1.396	30	-1.843	0.065	-1.138 .
				%CSA landscape	-0.099	0.076	30	-1.3	0.194	-0.826
				<b>Field management x %CSA landscape</b>	<b>0.194</b>	<b>0.087</b>	30	<b>2.221</b>	<b>0.026</b>	<b>1.802</b> *
	Granivorous carabids	0.22	0.99	Field management	0.876	0.474	30	1.849	0.064	0.295 .
				<b>Shrews</b>	<b>-0.557</b>	<b>0.244</b>	30	<b>-2.281</b>	<b>0.023</b>	<b>-0.440</b> *
	~~~~Granivorous carabids			~~~~Omnivorous carabids	0.132	-	30	0.693	0.247	0.132
SEM A: Invertebrate seed predation (with cage)	Invertebrate seed predation	0.14	0.99	<b>Omnivorous carabids</b>	<b>0.009</b>	<b>0.004</b>	30	<b>2.382</b>	<b>0.017</b>	<b>0.214</b> *
SEM B: Total seed predation (without cage)	Rodent	0.43	0.84	Field management	1.536	0.532	30	2.886	0.004	0.695 **
				%CSA landscape	0.113	0.027	30	4.122	<0.001	0.962 ***
				<b>Field management x %CSA landscape</b>	<b>-0.069</b>	<b>0.021</b>	30	<b>-3.197</b>	<b>0.001</b>	<b>-0.6533</b> **
	Total seed predation	0.11	0.99	<b>Omnivorous carabids</b>	0.010	0.005	30	1.895	0.058	0.214
~~~~Rodent			~~~~Shrew	<b>-0.398</b>	-	30	<b>-2.256</b>	<b>0.016</b>	<b>-0.398</b> *	

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92 **Figure S5:** Simplified SEMs of the June sampling session, with the removal of variables and  
 93 paths that do not lead to direct or indirect effects on (A) invertebrate and (B) total weed seed  
 94 predation. The black and red arrows denote significant positive and negative effects,  
 95 respectively. The grey dotted arrows indicate non-significant effects. Bidirectional arrows  
 96 show no causal correlations between variables. The black circles (●) show two-way  
 97 interactions. Standardised coefficients are shown for all paths. The numbers in parentheses  
 98 show the interaction coefficients. The numbers of asterisks indicate the level of significance (  
 99  $p < 0.1$ , \* $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.001$ ).

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101

102 **Table S9:** Parameter estimates from the simplified SEMs of the June sampling session, with  
 103 the removal of variables and paths that do not lead to direct or indirect effects on weed seed  
 104 predation. The response variables were distinguished according to whether they were present  
 105 in both SEMs or only one of the two SEMs. For each response variable we reported marginal  
 106 ( $R^2m$ ) and conditional ( $R^2c$ ) r-squared. For each predictor with reported unscale estimate,  
 107 standard error (SE), the critical ratio value (Crit. Value), the P-value and the standardized  
 108 estimate (Stand. estimate). The highlighted are predictors with  $p \leq 0.05$ . The numbers of  
 109 asterisks indicate the level of significance (.  $p < 0.1$ , \* $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.001$ ). The  
 110 SEM for invertebrate (Fisher's C = 12.43, P = 0.572) and total seed predation (Fisher's C = 1.22,  
 111 P = 0.875) represented our data well.

SEM	Response	R <sup>2</sup> m	R <sup>2</sup> c	Predictor	Unscale estimate	SE	DF	Crit. Value	p	Scaled estimate
Common to both SEMs	Animal resources	0.05	0.84	<b>Field management</b>	<b>0.216</b>	<b>0.077</b>	<b>14</b>	<b>7.977</b>	<b>0.014</b>	<b>0.216 *</b>
	Shrews	0.18	0.29	Field management	-2.572	1.396	30	-1.843	0.065	-1.138 .
				SCA%	-0.099	0.076	30	-1.300	0.194	-0.826 .
SEM A: Invertebrate seed predation (with cage)	Granivorous carabids	0.29	0.99	<b>Field management x %CSA landscape</b>	<b>0.194</b>	<b>0.087</b>	<b>30</b>	<b>2.221</b>	<b>0.026</b>	<b>1.802 *</b>
				<b>Field management</b>	<b>1.321</b>	<b>0.552</b>	<b>30</b>	<b>2.395</b>	<b>0.017</b>	<b>0.420 *</b>
				<b>Shrews</b>	<b>-0.635</b>	<b>0.269</b>	<b>30</b>	<b>-2.36</b>	<b>0.018</b>	<b>-0.473 *</b>
	Invertebrate seed	0.27	0.98	<b>Granivorous carabids</b>	<b>0.065</b>	<b>0.02</b>	<b>30</b>	<b>3.300</b>	<b>0.001</b>	<b>2.538 ***</b>
				Animal resources	0.705	0.439	30	1.606	0.108	0.171
				<b>Granivorous carabids x Animal resources</b>	<b>-0.025</b>	<b>0.008</b>	<b>30</b>	<b>-3.167</b>	<b>0.002</b>	<b>-2.450 **</b>
				<b>Field management</b>	<b>1.536</b>	<b>0.532</b>	<b>30</b>	<b>2.886</b>	<b>0.004</b>	<b>0.695 **</b>
SEM B: Total seed predation (without cage)	Rodents	0.43	0.84	<b>%CSA landscape</b>	<b>0.113</b>	<b>0.027</b>	<b>30</b>	<b>4.122</b>	<b>&lt;0.001</b>	<b>0.962 ***</b>
				<b>Field management x %CSA landscape</b>	<b>-0.069</b>	<b>0.021</b>	<b>30</b>	<b>-3.197</b>	<b>0.001</b>	<b>-0.653 **</b>
				<b>Management</b>	<b>1.173</b>	<b>0.267</b>	<b>30</b>	<b>4.385</b>	<b>&lt;0.001</b>	<b>0.274 ***</b>
	Total seed predation (without cage)	0.59	0.98	<b>Animal resources</b>	<b>-1.603</b>	<b>0.343</b>	<b>30</b>	<b>-4.68</b>	<b>&lt;0.001</b>	<b>-0.374 ***</b>
				<b>Rodent</b>	<b>0.076</b>	<b>0.028</b>	<b>30</b>	<b>2.679</b>	<b>0.007</b>	<b>0.197 **</b>
~Animal resources	~Rodent	0.271	-	30	1.465	0.077	0.271			

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