SUPPORTING INFORMATION

Wild Bee Exposure to Pesticides in Conservation Grasslands Increases Along an Agricultural Gradient: A Tale of Two Sample Types

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Supporting Information Summary:

Total pages: 13

Tables: 4

Figures 3

Additional comparisons

There was weak evidence that neither the number nor summed concentrations of pesticides in bands and bee tissue differed between Conservation Reserve Program grasslands planted with (CP42) and without (CRP) pollinator-friendly forbs (Fig. S2). Number of pesticides detected in bands deployed in plots without pollinator plantings was slightly more than from CP42 plots (GLM: slope ± standard error = -1.58 ± 0.78, t = -2.028, p = 0.049; month and proportion agriculture were included in the model). There was little to no evidence that pesticides concentrations in bands, or number of pesticides and pesticide concentrations in bee tissues varied between CRP and CP42 plots (GLM: p = 0.25, GLM: p = 0.94; PSM: p = 0.15, respectively).

The detection frequencies for herbicides and insecticides did not vary by month while fungicides were detected more frequently in August compared to July (W = 13.5, p = 0.01). However, in bees, no differences were observed in herbicide, insecticide, or fungicide detection frequencies by month (W = 13, p = 0.13; W = 34, p = 0.11; W = 29, p = 0.17, respectively). Be detection frequencies were lower in bees compared to bands (W = 1,738, p < 0.001).

Table S1. List of pesticides analyzed in silicone bands and bee tissue. LOD = limit of detection; NA = not analyzed.

Compound Name	CAS Number	Pesticide Type	Instrument	LOD Passive Sampler (ng/band)	LOD bee (ng/g) for 1 g sample	LOD bee (ng/g) for 0.1 g sample
3,4-Dichloroaniline	95-76-1	Transformation Product	LC-MS/MS	2	1	10
3,5-Dichloroaniline	626-43-7	Transformation Product	LC-MS/MS	2	1	10
Acetamiprid	135410-20-7	Insecticide	LC-MS/MS	2	1	10
Acetochlor	34256-82-1	Herbicide	LC-MS/MS	2	1	10
Acibenzolar-S-methyl	135158-54-2	Herbicide	GC-MS/MS	5	2	20
Allethrin	584-79-2	Insecticide	GC-MS/MS	2	2	20
Atrazine	1912-24-9	Herbicide	LC-MS/MS	2	1	10
Atrazine, 2-hydroxy	2163-68-0	Transformation Product	LC-MS/MS	2	NA	NA
Atrazine, desethyl	6190-65-4	Transformation Product	LC-MS/MS	2	1	10
Atrazine, desisopropyl	1007-28-9	Transformation Product	LC-MS/MS	2	1	10
Azoxystrobin	131860-33-8	Fungicide	LC-MS/MS	2	1	10
Benefin (Benfluralin)	1861-40-1	Insecticide	GC-MS/MS	2	1	10
Bentazon	25057-89-0	Herbicide	LC-MS/MS	2	NA	NA
Bicyclopyrone	352010-68-5	Herbicide	LC-MS/MS	2	1	10
Bifenthrin	82657-04-3	Insecticide	GC-MS/MS	2	1	10
Boscalid	188425-85-6	Fungicide	LC-MS/MS	2	1	10
Boscalid Metabolite - M510F01 Acetyl	661463-87-2	Transformation Product	LC-MS/MS	2	1	10
Bromuconazole	116255-48-2	Fungicide	LC-MS/MS	2	1	10
Butralin	33629-47-9	Herbicide	LC-MS/MS	2	1	10
Carbaryl	63-25-2	Insecticide	LC-MS/MS	2	1	10
Carbendazim	10605-21-7	Fungicide	LC-MS/MS	2	1	10
Carbofuran	1563-66-2	Insecticide	LC-MS/MS	2	1	10
Carbathiin (Carboxin)	5234-68-4	Fungicide	LC-MS/MS	2	1	10
Chlorantraniliprole	500008-45-7	Insecticide	LC-MS/MS	2	1	10
Chlorfenapyr	122453-73-0	Insecticide	GC-MS/MS	2	1	10
Chlorothalonil	1897-45-6	Fungicide	GC-MS/MS	5	2	20
Chlorpyrifos	2921-88-2	Insecticide	LC-MS/MS	2	1	10
Chlorpyrifos oxon	5598-15-12	Transformation Product	LC-MS/MS	5	1	10
Clomazone	81777-89-1	Herbicide	LC-MS/MS	2	1	10
Clothianidin	210880-92-5	Insecticide	LC-MS/MS	2	1	10
Clothianidin-desmethyl	135018-15-4	Transformation Product	LC-MS/MS	2	1	10
Coumaphos	56-72-4	Insecticide	LC-MS/MS	2	1	10
Cyantraniliprole	736994-63-1	Insecticide	LC-MS/MS	2	1	10
Cyazofamid	120116-88-3	Fungicide	LC-MS/MS	2	1	10
Cycloate	1134-23-2	Herbicide	LC-MS/MS	2	1	10
Cyfluthrin (all isomers)	68359-37-5	Insecticide	GC-MS/MS	2	1	10
Cyhalofop-butyl	122008-85-9	Herbicide	LC-MS/MS	2	1	10
Cyhalothrin (lambda and gamma)	68085-85-8	Insecticide	GC-MS/MS	2	1	10
Cymoxanil	57966-95-7	Fungicide	LC-MS/MS	2	1	10
Cypermethrin (all isomers)	52315-07-8	Insecticide	GC-MS/MS	2	1	10
Cyproconazole	94361-06-5	Fungicide	LC-MS/MS	2	1	10
Cyprodinil	121552-61-2	Fungicide	LC-MS/MS	2	1	10
DCPA (Dacthal)	1861-32-1	Transformation Product	LC-MS/MS	2	1	10

DCPMU (Diuron Transformation Product)	3567-62-2	Transformation Product	LC-MS/MS	2	1	10
DCPU (Diuron Transformation Product)	2327-02-8	Transformation Product	LC-MS/MS	2	1	10
Deltamethrin	52918-63-5	Insecticide	GC-MS/MS	2	1	10
Desthio-prothioconazole	120983-64-4	Transformation Product	LC-MS/MS	2	1	10
Diazinon	333-41-5	Insecticide	LC-MS/MS	2	1	10
Diazinon oxon	962-58-3	Transformation Product	LC-MS/MS	2	1	10
Dichlorvos	62-73-7	Transformation Product	LC-MS/MS	2	1	10
Difenoconazole	119446-68-3	Fungicide	LC-MS/MS	2	1	10
Dimethomorph	110488-70-5	Fungicide	LC-MS/MS	2	1	10
Dinotefuran	165252-70-0	Insecticide	LC-MS/MS	2	1	10
Dithiopyr	97886-45-8	Herbicide	GC-MS/MS	2	1	10
Diuron	330-54-1	Herbicide	LC-MS/MS	2	1	10
EPTC	759-94-4	Herbicide	LC-MS/MS	2	1	10
Esfenvalerate	66230-04-4	Insecticide	GC-MS/MS	2	1	10
Ethaboxam	162650-77-3	Fungicide	LC-MS/MS	2	1	10
Ethalfluralin	55283-68-6	Herbicide	GC-MS/MS	2	1	10
Etofenprox	80844-07-1	Insecticide	GC-MS/MS	2	1	10
Etoxazole	153233-91-1	Fungicide	LC-MS/MS	2	1	10
Famoxadone	131807-57-3	Fungicide	LC-MS/MS	2	NA	NA
Fenamidone	161326-34-7	Fungicide	LC-MS/MS	2	1	10
Fenarimol	60168-88-9	Fungicide	LC-MS/MS	2	NA	NA
Fenbuconazole	114369-43-6	Fungicide	LC-MS/MS	2	1	10
Fenhexamid	126833-17-8	Fungicide	LC-MS/MS	2	1	10
Fenpropathrin	71283-80-2	Insecticide	GC-MS/MS	2	1	10
Fenpyroximate	39515-41-8	Insecticide	LC-MS/MS	2	1	10
Fipronil	55-38-9	Insecticide	LC-MS/MS	2	1	10
Fipronil desulfinyl	205650-65-3	Transformation Product	LC-MS/MS	2	1	10
Fipronil desulfinyl amide	205650-69-7	Transformation Product	LC-MS/MS	2	1	10
Fipronil sulfide	120067-83-6	Transformation Product	LC-MS/MS	2	1	10
Fipronil sulfone	120068-36-2	Transformation Product	LC-MS/MS	2	1	10
Flonicamid	158062-67-0	Insecticide	LC-MS/MS	2	1	10
Fluazinam	79622-59-6	Insecticide	LC-MS/MS	2	NA	NA
Fludioxonil	131341-86-1	Fungicide	LC-MS/MS	2	1	10
Flufenacet	142459-58-3	Herbicide	LC-MS/MS	2	1	10
Flumetralin	62924-70-3	Plant Growth Regulator	LC-MS/MS	2	1	10
Fluopicolide	239110-15-7	Fungicide	LC-MS/MS	2	1	10
Fluopyram	658066-35-4	Fungicide	LC-MS/MS	2	1	10
Fluoxastrobin	193740-76-0	Fungicide	LC-MS/MS	2	1	10
Flupyradifurone	951659-40-8	Insecticide	LC-MS/MS	2	1	10
Fluridone	59756-60-4	Herbicide	LC-MS/MS	2	1	10
Fluroxypyr	69377-81-7	Herbicide	LC-MS/MS	2	1	10
Flusilazole	85509-19-9	Fungicide	LC-MS/MS	2	NA	NA
Flutolanil	66332-96-5	Fungicide	LC-MS/MS	2	1	10
Flutriafol	76674-21-0	Fungicide	LC-MS/MS	2	1	10
Fluxapyroxad	907204-31-3	Fungicide	LC-MS/MS	2	1	10
Hexazinone	51235-04-2	Herbicide	LC-MS/MS	2	1	10
Imazalil	35554-44-0	Fungicide	LC-MS/MS	2	1	10
Imazapyr	35554-44-0	Herbicide	LC-MS/MS	2	NA	NA
Imazethapyr	81334-34-1	Herbicide	LC-MS/MS	2	1	10

Imidacloprid	138261-41-3	Insecticide	LC-MS/MS	2	1	10
Imidacloprid desnitro	127202-53-3	Transformation Product	LC-MS/MS	2	1	10
Imidacloprid olefin	115086-54-9	Transformation Product	LC-MS/MS	2	1	10
Imidacloprid urea	120868-66-8	Transformation Product	LC-MS/MS	2	1	10
Imidacloprid, 5-hydroxy	380912-09-4	Transformation Product	LC-MS/MS	2	1	10
Indaziflam	950782-86-2	Herbicide	LC-MS/MS	2	1	10
Indoxacarb	173584-44-6	Insecticide	LC-MS/MS	2	1	10
Ipconazole	125225-28-7	Fungicide	LC-MS/MS	2	1	10
Iprodione	36734-19-7	Fungicide	LC-MS/MS	2	1	10
Kresoxim-methyl	143390-89-0	Fungicide	LC-MS/MS	2	1	10
Malathion	121-75-5	Insecticide	LC-MS/MS	2	1	10
Malathion oxon	1634-78-2	Transformation Product	LC-MS/MS	2	1	10
Mandipropamid	374726-62-2	Fungicide	LC-MS/MS	2	1	10
Mesotrione	104206-82-8	Herbicide	LC-MS/MS	2	1	10
Metalaxyl	57837-19-1	Fungicide	LC-MS/MS	2	1	10
Metalaxyl alanine metabolite	NA	Transformation Product	LC-MS/MS	2	1	10
Metconazole	125116-23-6	Fungicide	LC-MS/MS	2	1	10
Methamidophos	10265-92-6	Insecticide	LC-MS/MS	2	NA	NA
Methoprene	40596-69-8	Insecticide	GC-MS/MS	2	NA	NA
Methoxyfenozide	161050-58-4	Insecticide	LC-MS/MS	2	1	10
Metolachlor (R and S)	51218-45-2	Herbicide	LC-MS/MS	2	1	10
Myclobutanil	88671-89-0	Fungicide	LC-MS/MS	2	1	10
Napropamide	15299-99-7	Herbicide	LC-MS/MS	2	1	10
Novaluron	116714-46-6	Herbicide	LC-MS/MS	2	1	10
Oryzalin	19044-88-3	Herbicide	LC-MS/MS	2	1	10
Oxadiazon	19666-30-9	Herbicide	LC-MS/MS	2	1	10
Oxathiapiprolin	1003318-67-9	Fungicide	LC-MS/MS	2	1	10
Oxyfluorfen	42874-03-3	Herbicide	LC-MS/MS	2	1	10
p,p'-DDD	72-54-8	Transformation Product	GC-MS/MS	2	1	10
p,p'-DDE	72-55-9	Transformation Product	GC-MS/MS	2	1	10
p,p'-DDT	50-29-3	Insecticide	GC-MS/MS	2	1	10
Paclobutrazol	76738-62-0	Fungicide	LC-MS/MS	2	1	10
Pendimethalin	40487-42-1	Herbicide	LC-MS/MS	2	1	10
Penoxsulam	219714-96-2	Herbicide	LC-MS/MS	2	1	10
Pentachloroanisole (PCA)	1825-21-4	Insecticide	GC-MS/MS	2	1	10
Pentachloronitrobenzene (PCNB)	82-68-8	Fungicide	GC-MS/MS	2	1	10
Penthiopyrad	183675-82-3	Fungicide	LC-MS/MS	2	1	10
Permethrin (cis and trans)	52645-53-1	Insecticide	GC-MS/MS	2	1	10
Phenothrin	26002-80-2	Insecticide	GC-MS/MS	2	1	10
Phosmet	732-11-6	Insecticide	LC-MS/MS	2	1	10
Picoxystrobin	117428-22-5	Fungicide	LC-MS/MS	2	1	10
Piperonyl Butoxide	51-03-6	Synergist	LC-MS/MS	2	1	10
Prodiamine	29091-21-2	Herbicide	LC-MS/MS	2	1	10
Prometon	1610-18-0	Herbicide	LC-MS/MS	2	1	10
Prometryn	7287-19-6	Herbicide	LC-MS/MS	2	1	10
Propanil	709-98-8	Herbicide	LC-MS/MS	2	1	10
Propargite	2312-35-8	Insecticide	LC-MS/MS	2	1	10
Propiconazole (cis and trans)	60207-90-1	Fungicide	LC-MS/MS	2	1	10

Propyzamide	23950-58-5	Herbicide	LC-MS/MS	2	1	10
Pyraclostrobin	175013-18-0	Fungicide	LC-MS/MS	2	1	10
Pyridaben	96489-71-3	Insecticide	LC-MS/MS	2	1	10
Pyrimethanil	53112-28-0	Fungicide	LC-MS/MS	2	1	10
Pyriproxyfen	95737-68-1	Insecticide	LC-MS/MS	2	1	10
Quinclorac	84087-01-4	Fungicide	LC-MS/MS	2	1	10
Quinoxyfen	124495-18-7	Fungicide	LC-MS/MS	2	1	10
Resmethrin (cis and trans)	10453-86-8	Insecticide	GC-MS/MS	2	1	10
Sedaxane	874967-67-6	Fungicide	LC-MS/MS	2	1	10
Simazine	122-34-9	Herbicide	LC-MS/MS	2	1	10
Sulfometuron-Methyl	74222-97-2	Herbicide	LC-MS/MS	2	1	10
Sulfoxaflor	945678-00-3	Insecticide	LC-MS/MS	2	1	10
tau-Fluvalinate	102851-06-9	Insecticide	GC-MS/MS	2	1	10
Tebuconazole	107534-96-3	Fungicide	LC-MS/MS	2	1	10
Tebuconazole t-butylhydroxy	212267-64-6	Transformation Product	LC-MS/MS	2	1	10
Tebufenozide	112410-23-8	Insecticide	LC-MS/MS	2	1	10
Tebupirimfos	96182-53-5	Insecticide	LC-MS/MS	2	1	10
Tebupirimfos oxon	NA	Transformation Product	LC-MS/MS	2	1	10
Tefluthrin	79538-32-2	Insecticide	GC-MS/MS	2	1	10
Tetraconazole	112281-77-3	Fungicide	LC-MS/MS	2	1	10
Tetramethrin	7696-12-0	Insecticide	GC-MS/MS	2	1	10
Thiabendazole	148-79-8	Fungicide	LC-MS/MS	2	1	10
Thiacloprid	111988-49-9	Insecticide	LC-MS/MS	2	1	10
Thiamethoxam	153719-23-4	Insecticide	LC-MS/MS	2	1	10
Thiamethoxam Transformation Product (CGA-355190)	NA	Transformation Product	LC-MS/MS	2	1	10
Thiamethoxam Transformation Product (NOA-404617)	NA	Transformation Product	LC-MS/MS	2	1	10
Thiamethoxam Transformation Product (NOA-407475)	NA	Transformation Product	LC-MS/MS	2	1	10
Thiobencarb	28249-77-6	Herbicide	LC-MS/MS	2	1	10
Tolfenpyrad	129558-76-5	Insecticide	LC-MS/MS	2	1	10
Triadimefon	43121-43-3	Fungicide	LC-MS/MS	2	1	10
Triadimenol	55219-65-3	Fungicide	LC-MS/MS	2	1	10
Triallate	2303-17-5	Herbicide	LC-MS/MS	2	1	10
Tribufos	78-48-8	Herbicide	LC-MS/MS	2	1	10
Tricyclazole	41814-78-2	Fungicide	LC-MS/MS	2	1	10
Trifloxystrobin	141517-21-7	Fungicide	LC-MS/MS	2	1	10
Triflumizole	68694-11-1	Fungicide	LC-MS/MS	2	1	10
Trifluralin	1582-09-8	Herbicide	GC-MS/MS	2	1	10
Triticonazole	131983-72-7	Fungicide	LC-MS/MS	2	1	10
Vinclozolin	50471-44-8	Fungicide	GC-MS/MS	2	1	10
Zoxamide	156052-68-5	Fungicide	LC-MS/MS	2	1	10

Table S2. Linear models testing effects of surrounding agricultural land use, month, and bee size on pesticides accumulated on passive samples (bands) and bees in July and August 2019 surrounded by varying proportions of agricultural land. Significant models ($p < 0.05$) are indicated in bold.

Model	df_{diff}	LL_{diff}	χ^2	p	type
Number of Pesticides Detected					
Band Pesticide Frequency ~ Agriculture + Month	-2	-16.14	32.3	**<0.001**	GLM
Bee Pesticide Frequency ~ Agriculture + Month + Size	-3	19.46	38.9	**<0.001**	GLM
Pesticide Concentrations	df_{diff}	LL_{diff}	χ^2		
Band Pesticides ~ Agriculture + Month	-2	-17.76	35.5	**<0.001**	GLM
Band Herbicides† ~ Agriculture + Month +A*M	-3	-41.82	83.6	**<0.001**	GLM
Band Insecticides ~ Agriculture + Month	-2	-13.76	27.5	**<0.001**	GLM
	df	LL	χ^2		
Band Fungicides ~ Agriculture + Month	2	-70.3	56.0	**<0.001**	PSM
Bee Pesticides ~ Agriculture + Month + Bee Size	3	-132.5	23.8	**<0.001**	PSM
Bee Herbicides ~ Agriculture + Month + Bee Size	3	-208.5	5.6	0.13	PSM
Bee Insecticides ~ Agriculture + Month +Bee Size	3	-101.9	29.7	**<0.001**	PSM
Bee Fungicides ~ Agriculture + Month + Bee Size+ A*M + A*S + M*S + A*M*S	7	-196.5	49.2	**<0.001**	PSM
Bee Concentration ~ Band Concentration			t_{Ken}		
Atrazine‡*	--	--	0.14	**<0.001**	ATS
Azoxystrobin	--	--	0.24	**<0.001**	ATS
Cyproconazole‡	--	--	0.08	**0.006**	ATS
Metconazole‡	--	--	0.16	**<0.001**	ATS
Metolachlor‡*	--	--	0.10	**<0.001**	ATS
Permethrin	--	--	0.07	0.20	ATS
Propiconazole‡	--	--	0.07	*0.06*	ATS
Pyraclostrobin	--	--	0.31	**<0.001**	ATS

†Interaction included to meet linear model assumptions.

‡ > 80% of y-values censored.

***** Only y-values are censored.

For general linear models (GLM), model significance (versus null) was calculated using log-likelihood test. Differences in degrees of freedom (df_{diff}) and log-likelihoods (LL_{diff}) were used to calculate the test statistic (χ^2). For parametric survival models with censored data (PSM), degrees of freedom (df) and log likelihood (LL) used to calculate the test statistic (χ^2). For non-parametric censored regression (a.k.a., Akritas-Theil-Sen line; ATS), significance was calculated using Kendall's tau (t_{Ken})

Table S3. Parameter estimates (β) and their standard errors (SE) for significant models explaining variation in pesticides accumulated on passive samples (bands) and bees surrounded by varying proportions of agricultural land. Significant terms ($p < 0.05$) are indicated in bold.

Dependent Variable	Parameter	*β*	*SE*	*t*	*p*
Number of Pesticides Detected					
Band:	July (Intercept)	10.30	0.93	11.1	**<0.001**
Proportion Agriculture +	Agriculture	2.42	1.72	1.4	0.17
Month	August (vs. July)	5.13	0.80	6.4	**<0.001**
Ln(Bee):	July (Intercept)	-0.01	0.10	-0.1	0.93
Proportion Agriculture +	Agriculture	-0.07	0.14	-0.57	0.61
Month +	August (vs. July)	0.26	0.07	3.6	**<0.001**
Bee Size	Large (vs. Small)	0.45	0.07	6.1	**<0.001**
Pesticide Concentrations					
Band					
Ln(Pesticide):	July (Intercept)	6.67	0.17	40.2	**<0.001**
Proportion Agriculture +	Agriculture	1.51	0.31	4.9	**<0.001**
Month	August (vs. July)	-0.72	0.14	-5.0	**<0.001**
Ln(Herbicide):	July (Intercept)	6.69	0.20	33.8	**<0.001**
Proportion Agriculture +	Agriculture	1.37	0.41	3.4	**0.001**
Month +	August (vs. July)	-1.43	0.28	-5.1	**<0.001**
Ag * Month	Ag * Month	-0.99	0.57	-1.7	*0.09*
Ln(Insecticide):	July (Intercept)	3.28	0.32	10.2	**<0.001**
Proportion Agriculture +	Agriculture	0.92	0.60	1.6	0.13
Month	August (vs. July)	1.58	0.28	5.7	**<0.001**
				z	*p*
Ln(Fungicide):	July (Intercept)	1.31	0.37	3.5	**<0.001**
Proportion Agriculture +	Agriculture	2.07	0.68	3.1	**0.002**
Month	August (vs. July)	3.11	0.31	9.9	**<0.001**
Bee					
Ln(Pesticide):	Intercept	-0.05	0.66	-0.1	0.94
Proportion Agriculture +	Agriculture	-0.19	1.02	-0.2	0.86
Month +	August (vs. July)	0.96	0.48	2.0	**0.047**
Bee Size	Large (vs. Small)	2.23	0.49	4.5	**<0.001**
Ln(Insecticide):	Intercept	-1.67	0.81	-2.1	**0.04**
Proportion Agriculture +	Agriculture	-0.31	1.11	-0.3	0.78
Month +	August (vs. July)	0.82	0.53	1.6	0.12
Bee Size	Large (vs. Small)	2.81	0.59	1.7	**<0.001**
Ln(Fungicide):	Intercept	3.44	1.77	2.0	*0.052*
Proportion Agriculture +	Agriculture	-13.6	6.28	-2.2	**0.031**
Month +	August (vs. July)	-3.68	2.15	-1.7	*0.086*
Bee Size +	Large (vs. Small)	-4.39	2.2	-2.0	**0.042**
Ag*Month +	Ag*August	12.89	6.72	1.9	*0.055*
Ag*Bee Size +	Ag*Large	12.92	6.71	1.9	*0.054*
Month*Bee Size +	August*Large	6.96	2.65	2.6	**0.009**
Ag*Month*Bee Size	Ag*August*Large	-10.85	7.38	-1.5	0.14
Bee Concentration ~ Band Concentration				t_{Ken}	*p*
Ln(Atrazine Bee):	Intercept	-3.79	--	--	--
Ln(Atrazine Band)	Ln(Band)	1.01	--	0.14	**<0.001**
Ln(Azoxystrobin Bee):	Intercept	-1.16	--	--	--
Ln(Azoxystrobin Band)	Ln(Band)	0.63	--	0.24	**<0.001**
Ln(Cyproconazole Bee):	Intercept	-3.55	--	--	--
Ln(Cyproconazole Band)	Ln(Band)	2.52	--	0.08	**0.006**
Ln(Metconazole Bee):	Intercept	-2.06	--	--	--
Ln(Metconazole Band)	Ln(Band)	1.13	--	0.16	**<0.001**

Ln(Metolachlor Bee):	Intercept	-11.16	--	--	--
Ln(Metolachlor Band)	Ln(Band)	2.07	--	0.10	**<0.001**
Ln(Pyraclostrobin Bee):	Intercept	-1.58	--	--	--
Ln(Pyraclostrobin Band)	Ln(Band)	0.78	--	0.31	**<0.001**

Test statistics are Student's *t*, Wald *Z* (Z_{Wald}), *F*, and Kendall's tau (t_{Ken}).

Table S4. Summary of toxicity units (TU) for pesticides detected at a TU >0.01 in at least one bee tissue sample.

	Contact		Oral	
Pesticide	**Samples with TU >0.01**	**Max**	**Samples with TU >0.01**	Max
Bifenthrin	3	0.03	1	0.01
Cyhalothrin	4	0.03	0	--
Indoxacarb	1	0.01	0	--
Permethrin	44	0.41	45	0.75

Figure S1. Location map of US Department of Agriculture Conservation Reserve Fields and study area in eastern Iowa, USA.

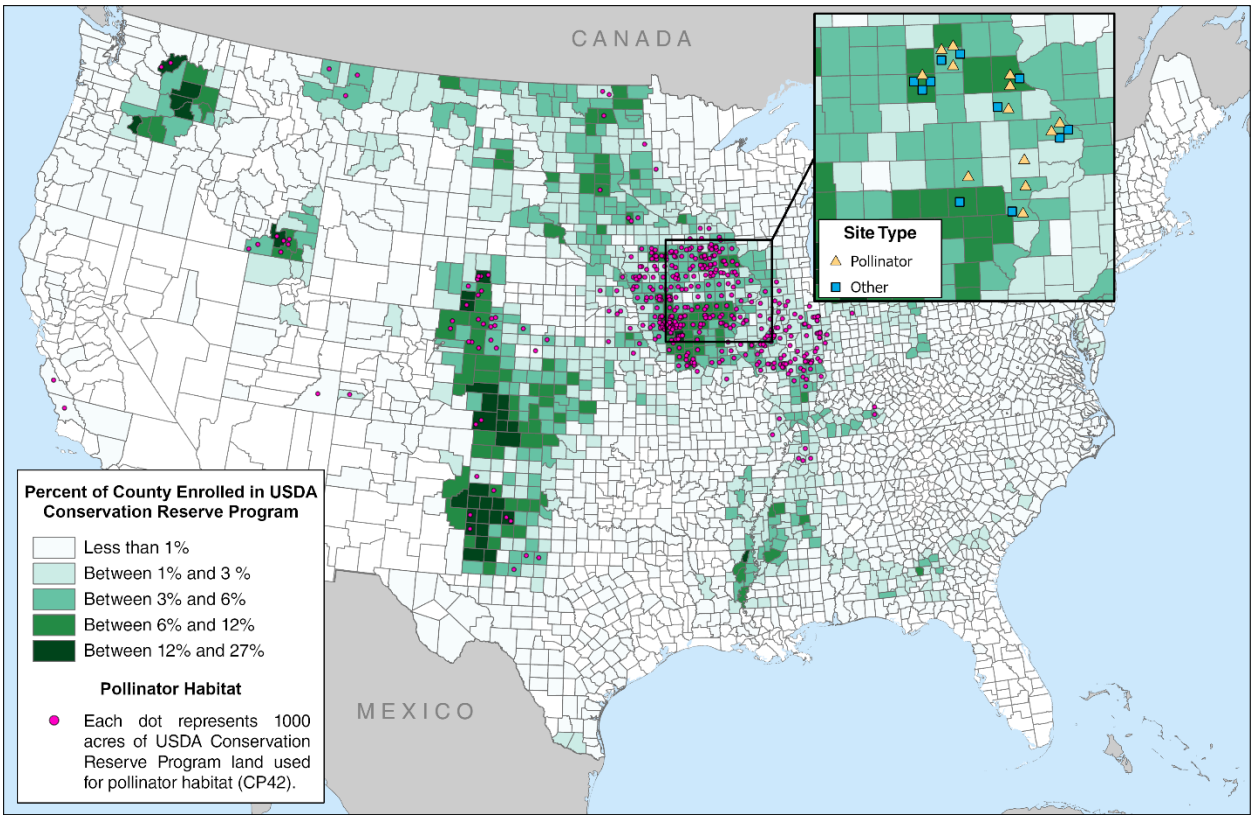

Figure S2. Number of pesticides detected (A, B) and summed concentrations of pesticides (C, D) in passive sampler bands (A, C) and bee tissues (B, D) from grassland fields enrolled in the Conservation Reserve Program without (CRP) or with (CP42) pollinator plantings in eastern Iowa, USA.

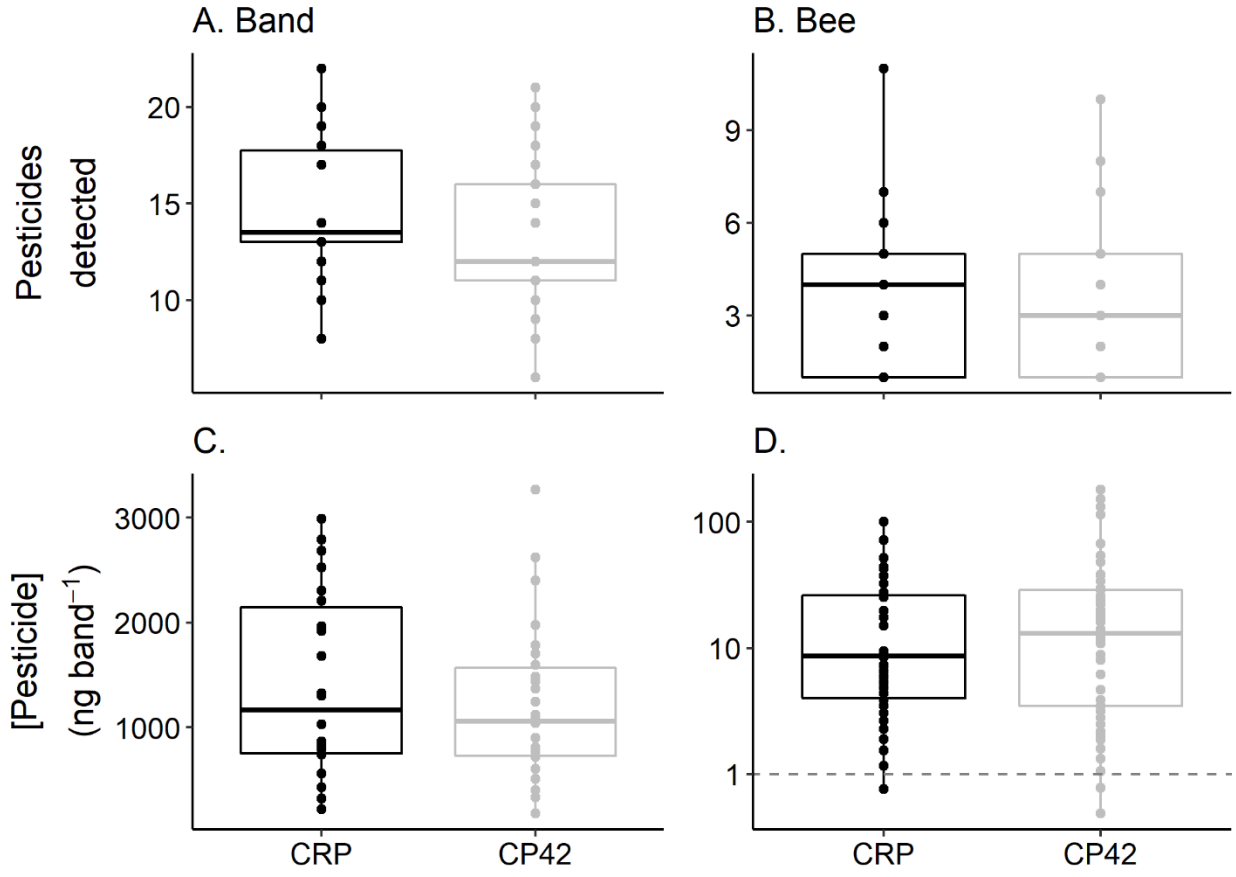

Figure S3. Detection frequencies of 45 pesticides detected in passive samples (i.e., silicone bands) and bee tissue collected from fields in eastern Iowa, USA, separated by month; compounds with an asterisk (*) are transformation products. The plant growth regulator, flumetralin, is not included; only detected in 2% of bee samples in August. Pesticides not detected in any sample are not shown.

	Silicone Bands		Bee Tissue	
	July	Aug	July	Aug
Herbicides				
Acetochlor	100	100	12	0
Atrazine	100	100	26	0
Atrazine, Desethyl*	100	8	0	0
Atrazine, Desisopropyl*	100	4	0	0
Dithiopyr	88	4	0	2
DCPU*	0	0	2	2
3,4-Dichloroaniline*	0	0	0	4
Metolachlor	100	100	19	0
Pendimethalin	29	4	0	0
Insecticides				
Bifenthrin	42	100	0	5
Carbaryl	4	4	0	0
Chlorantraniliprole	0	8	0	4
Chlorpyrifos	83	100	0	0
Chlorpyrifos Oxon*	0	54	0	0
Cyfluthrin	0	21	0	0
Cyhalothrin	0	100	2	7
Cypermethrin	0	25	0	0
Fipronil Sulfide*	0	0	0	2
Fipronil Sulfone*	0	0	0	2
Fenpyroximate	0	0	0	2
Indoxacarb	0	0	0	2
Malathion	4	0	0	0
Malathion Oxon*	13	0	0	0
Permethrin	21	42	38	53
Tebupirimfos	75	0	0	0
Tebupirimfos Oxon*	38	0	0	0
THX Deg (NOA-407475)*	0	0	10	2
Tefluthrin	100	63	0	0
Fungicides				
Azoxystrobin	0	100	7	62
Chlorothalonil	33	8	12	16
Cyproconazole	0	75	0	16
Desthioprothioconazole*	4	96	0	7
Fenbuconazole	0	0	2	2
Fluopicolide	0	0	10	0
Fluopyram	63	13	0	0
Flutriafol	0	13	0	2
Fluxapyroxad	13	75	0	9
Metconazole	0	83	0	20
Picoxystrobin	0	58	0	7
Propiconazole	0	100	5	22
Pyraclostrobin	4	83	0	55
Tebuconazole	0	38	0	2
Tetraconazole	4	0	0	0
Trifloxystrobin	0	63	0	7
Triflumizole	17	0	0	0