Appendix S1

Ecological Applications

The day after mowing: Time and type of mowing influence grassland arthropods

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Material and methods

<u>Additional diversity models without abundance correction</u>

As in the main analysis, the abundance and diversity models differ in sample size due to more sorted samples at the arthropod order level than at the species level.

Besides the abundance-accounted species richness models from our main analysis (which included abundance of the respective order as a covariate), we also fitted one model per order which did not include abundance as a covariate. Therefore, we ran two generalized mixed models with Poisson distributions for Orthoptera and Hemiptera. To solve overdispersion we performed two negative binomial models for Araneae and Coleoptera by using the *glmmTMB* package (Brooks et al., 2017). Significance was calculated based on type II sums of squares.

In addition, to implement another measure of diversity that accounts for abundance, we ran models with the $\log(x+1)$ transformed inverse Simpson diversity index as the response variable (Simpson, 1949). Therefore, we fitted four linear mixed models for all arthropod orders using the lme4 package (Bates et al., 2015). Significance was calculated based on type II sums of squares.

To calculate pairwise contrasts for the categorical variable "mower", we performed "Tukey" post hoc tests using the "glht" function of the *multcomp* package (Hothorn et al., 2008). Additionally, to mitigate type I errors, we used the Benjamini-Hochberg false discovery rate (FDR) correction to obtain adjusted p-values for the four tests (per arthropod order) performed (Benjamini & Hochberg, 1995). Model fit and dispersion was assessed using the DHARMa package (Hartig, 2022) and variance inflation factor (VIF) with the performance package (Lüdecke et al., 2021). VIFs were always smaller than 4, indicating no serious collinearity between the linear fixed effects. Model predictions were obtained with the sjPlot package (Lüdecke, 2023).

Interaction of days after mowing and number of cuts

To test whether days after mowing and number of cuts are interacting, we performed additional negative binomial models on abundance. For this, we used the same models as in our main analysis using the *glmmTMB* package (Brooks et al., 2017) but omitted the "mower" and "grazing" variables to only look at the mowing effects and included an interaction term between days after mowing and number of cuts. Furthermore, we only compared 1 - 3 times mown meadows, as more frequently mown meadows are rare in our study area. Obtaining p-values and model validation were performed as with the previous negative binomial models.

Abundance models without days after mowing

To see if the strong effects of 'days after mowing' would override other variables we performed the same negative binomial abundance models (*glmmTMB* package (Brooks et al., 2017)) as in the main analysis, but removed the variable 'days after mowing'. Obtaining p-values and model validation were performed as with the previous negative binomial models.

Additional information of the main analysis
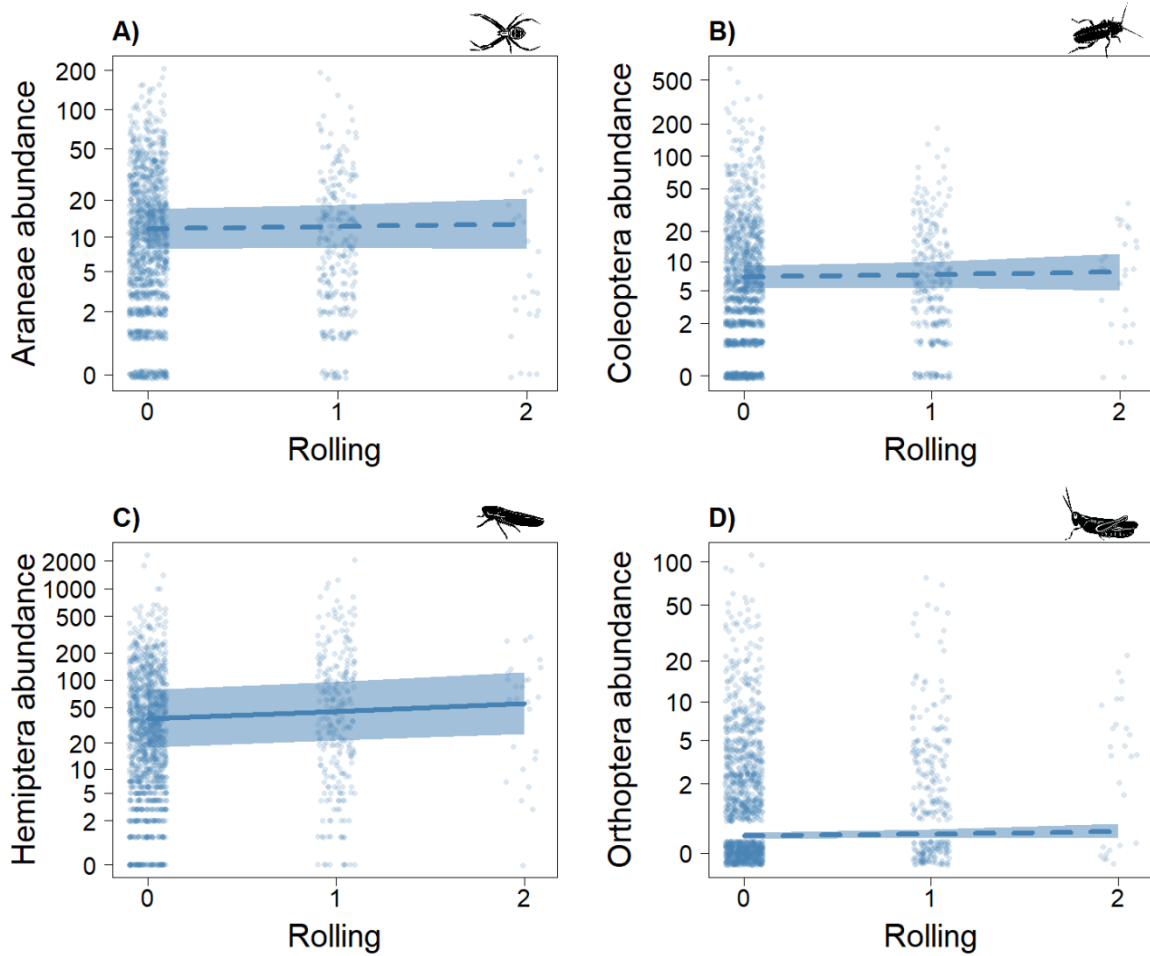
Figure S1: Abundances of A) Araneae, B) Coleoptera, C) Hemiptera, and B) Orthoptera (negative binomial models) in response to rolling (counts of rolling conducted per year). Sample size = 1,516. Points display raw count values, and lines (dashed = non-significant, solid = significant after FDR correction) show model predictions accounting for the other fixed effects (shaded area marks 95% confidence intervals). For visualization, y-axes were log(x+1) transformed. All arthropod icons are illustrated by Johanna L. Berger.
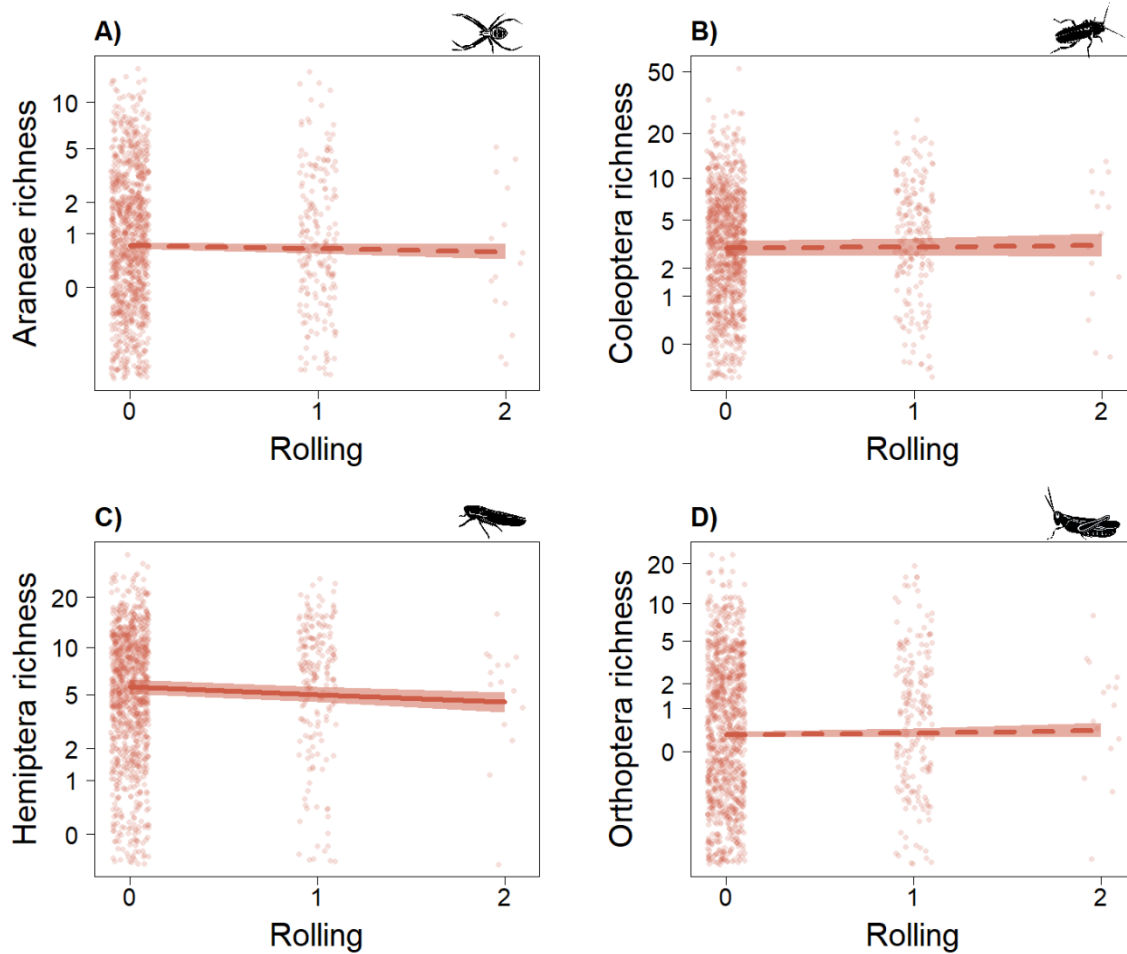
Figure S2: Abundance-accounted species richness of A) Araneae, B) Coleoptera, C) Hemiptera, and B) Orthoptera (generalized mixed models) in response to rolling (counts of rolling conducted per year). Sample size = 1,221. Points display raw count values, and lines (dashed = non-significant, solid = significant after FDR correction) show model predictions accounting for the other fixed effects (shaded area marks 95% confidence intervals). For visualization, y-axes were log(x+1) transformed. All arthropod icons are illustrated by Johanna L. Berger.
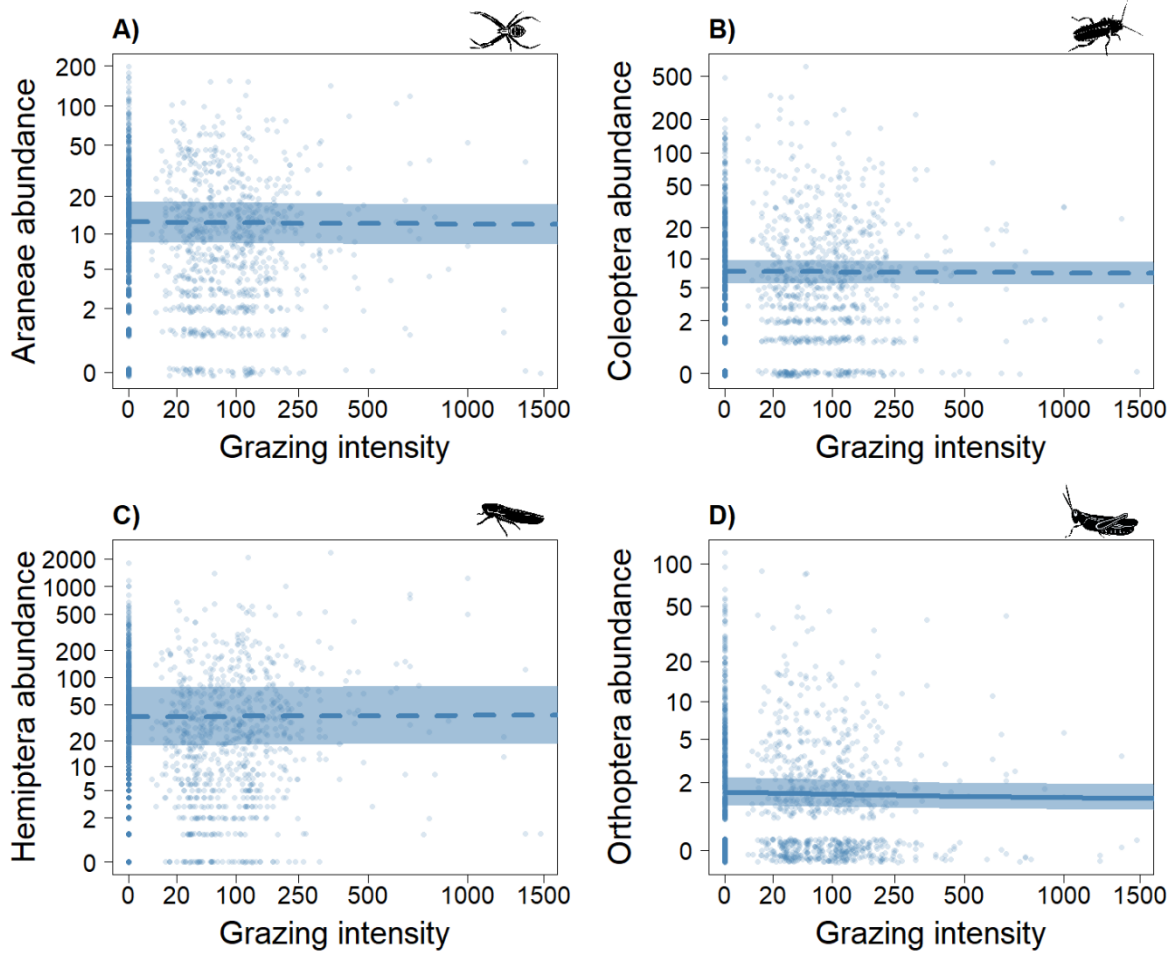
Figure S3: Abundances of A) Araneae, B) Coleoptera, C) Hemiptera, and B) Orthoptera (negative binomial models) in response to grazing intensity (livestock units per hectare and days of grazing = GVE*d/ha). Sample size = 1,516. Points display raw count values, and lines (dashed = non-significant, solid = significant after FDR correction) show model predictions accounting for the other fixed effects (shaded area marks 95% confidence intervals). For visualization, y-axes were log(x+1) transformed and x-axes were sqrt transformed. All arthropod icons are illustrated by Johanna L. Berger.
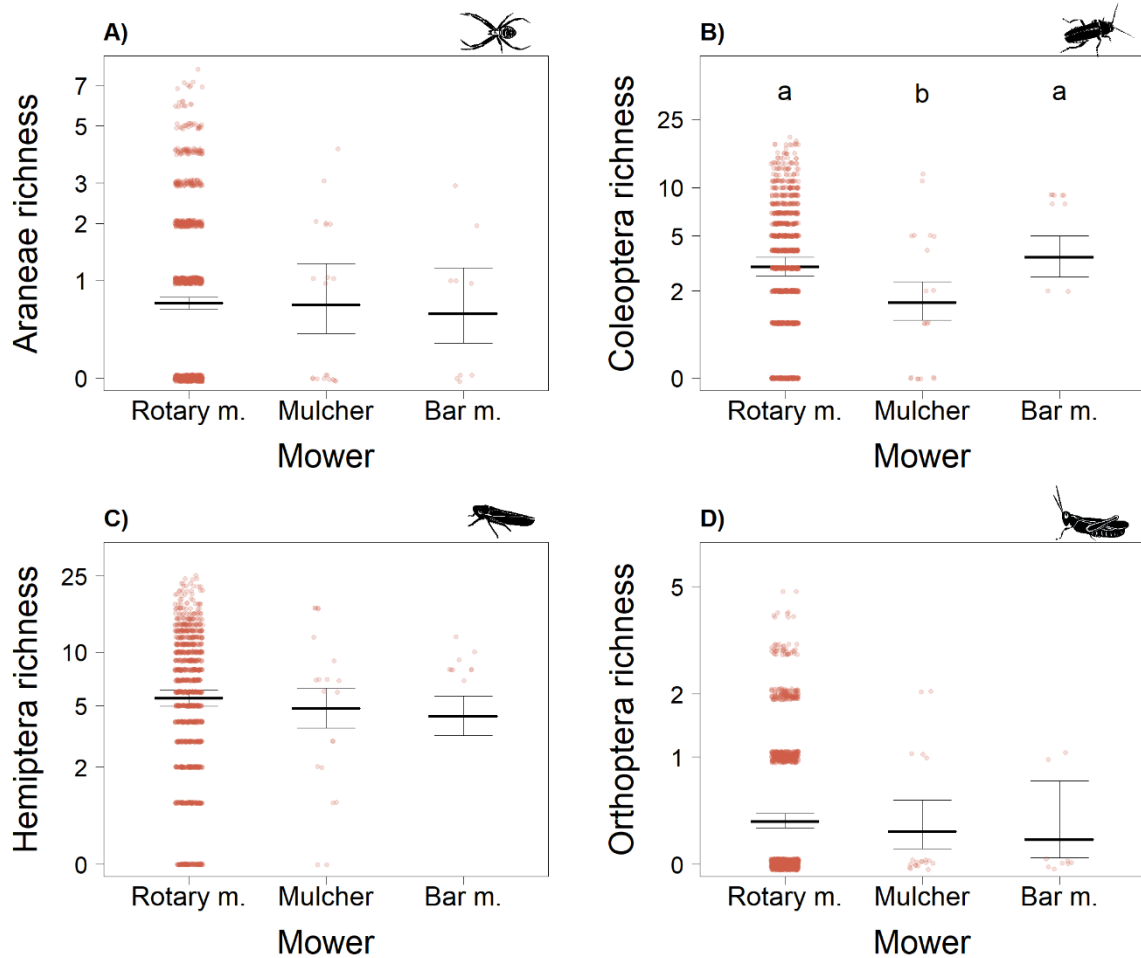
Figure S4: Differences of the abundance-accounted species richness (horizontal lines show means and 95% confidence intervals) of A) Araneae, B) Coleoptera, C) Hemiptera, and D) Orthoptera between the different mowing machines: rotary mower (n= 1,196), mulcher (n=16) and bar mower (n=9). Sample size = 1,221. Points display raw values, error bars show model predictions that account for all other covariates. Letters show significant differences. For visualization, y-axes were log(x+1) transformed. Abbreviations: Bar m. = Bar mower, Rotary m. = Rotary mower. All arthropod icons are illustrated by Johanna L. Berger.

Table S1: Summary statistics (Estimate, Standard Error, z-, and p-value) of the negative binomial models with the abundance of Araneae, Coleoptera, Hemiptera, and Orthoptera as response variables. Sample size = 1,516. P-values were obtained from type II sums of squares and, for mower types, by Tukey's post hoc tests. Bold P-values indicate statistical significance after FDR correction.

Response	Araneae				Coleoptera				Hemiptera				Orthoptera			
	Est.	*SE*	*z*	*p*	*Est.*	*SE*	*z*	*p*	*Est.*	*SE*	*z*	*p*	*Est.*	*SE*	*z*	*p*
Days after mowing	**0.349**	**0.051**	**6.869**	**<0.001**	**0.528**	**0.069**	**7.697**	**<0.001**	**0.350**	**0.050**	**6.953**	**<0.001**	**0.607**	**0.095**	**6.424**	**<0.001**
Width	-0.033	0.041	-0.814	0.416	-0.072	0.049	-1.463	0.143	0.022	0.040	0.561	0.575	**0.192**	**0.076**	**2.546**	**0.011**
Conditioner	-0.068	0.086	-0.791	0.429	-0.109	0.110	-0.988	0.323	-0.144	0.085	-1.693	0.091	-0.125	0.150	-0.834	0.404
Height	0.056	0.044	1.275	0.202	0.054	0.048	1.111	0.267	0.055	0.044	1.242	0.214	0.079	0.082	0.964	0.335
Julian day	0.215	0.350	0.614	0.539	**3.055**	**0.457**	**6.691**	**<0.001**	**2.911**	**0.325**	**8.965**	**<0.001**	**5.032**	**0.876**	**5.748**	**<0.001**
Julian day^2	0.001	0.348	0.003	0.997	**-3.480**	**0.461**	**-7.557**	**<0.001**	**-2.885**	**0.326**	**-8.860**	**<0.001**	**-6.595**	**0.932**	**-7.075**	**<0.001**
Rolling	0.021	0.037	0.558	0.577	0.026	0.045	0.575	0.565	**0.090**	**0.035**	**2.594**	**0.009**	0.095	0.058	1.642	0.101
Leveling	-0.022	0.037	-0.592	0.554	0.005	0.045	0.107	0.915	0.014	0.035	0.388	0.698	-0.013	0.060	-0.209	0.834
Cuts prev. year	-0.056	0.030	-1.885	0.059	-0.035	0.038	-0.914	0.361	0.000	0.028	0.016	0.987	0.056	0.046	1.236	0.217
Cuts	-0.028	0.044	-0.640	0.522	0.024	0.058	0.421	0.674	0.011	0.044	0.243	0.808	0.050	0.072	0.688	0.491
Fertilization	-0.079	0.042	-1.868	0.062	-0.002	0.051	-0.037	0.971	-0.093	0.042	-2.224	0.026	-0.123	0.068	-1.795	0.073
Grazing	-0.049	0.033	-1.478	0.139	-0.051	0.043	-1.184	0.236	0.035	0.033	1.074	0.283	**-0.164**	**0.061**	**-2.678**	**0.007**
Temperature	**0.278**	**0.043**	**6.465**	**<0.001**	**0.188**	**0.057**	**3.315**	**0.001**	**0.398**	**0.040**	**9.865**	**<0.001**	0.028	0.070	0.399	0.690

Response	Araneae				Coleoptera				Hemiptera				Orthoptera			
	Est.	*SE*	*z*	*p*	*Est.*	*SE*	*z*	*p*	*Est.*	*SE*	*z*	*p*	*Est.*	*SE*	*z*	*p*
Precipitation	**-0.070**	**0.031**	**-2.286**	**0.022**	-0.014	0.040	-0.357	0.721	**-0.086**	**0.029**	**-2.978**	**0.003**	-0.083	0.046	-1.797	0.072
Pairwise contrasts: mower types																
Mulcher - Rotary m.	**-1.174**	**0.265**	**-4.428**	**<0.001**	-0.724	0.348	-2.078	0.088	**-0.892**	**0.245**	**-3.639**	**0.001**	-0.516	0.443	-1.167	0.456
Bar m. - Rotary m.	0.257	0.426	0.602	0.810	0.702	0.559	1.256	0.404	0.598	0.401	1.491	0.280	0.393	0.707	0.556	0.835
Bar m. - Mulcher	**1.431**	**0.497**	**2.879**	**0.010**	1.426	0.648	2.202	0.066	**1.491**	**0.465**	**3.207**	**0.003**	0.909	0.828	1.098	0.498

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Table S2: Summary statistics (Estimate, Standard Error, z-, and P-value) of the four abundance-accounted models with the species richness of Araneae, Coleoptera, Hemiptera, and Orthoptera (generalized mixed models), as response variables. Sample size = 1,217. P-values were obtained from type II sums of squares and, for mower types, by Tukey's post hoc tests. Bold P-values indicate statistical significance after FDR correction.

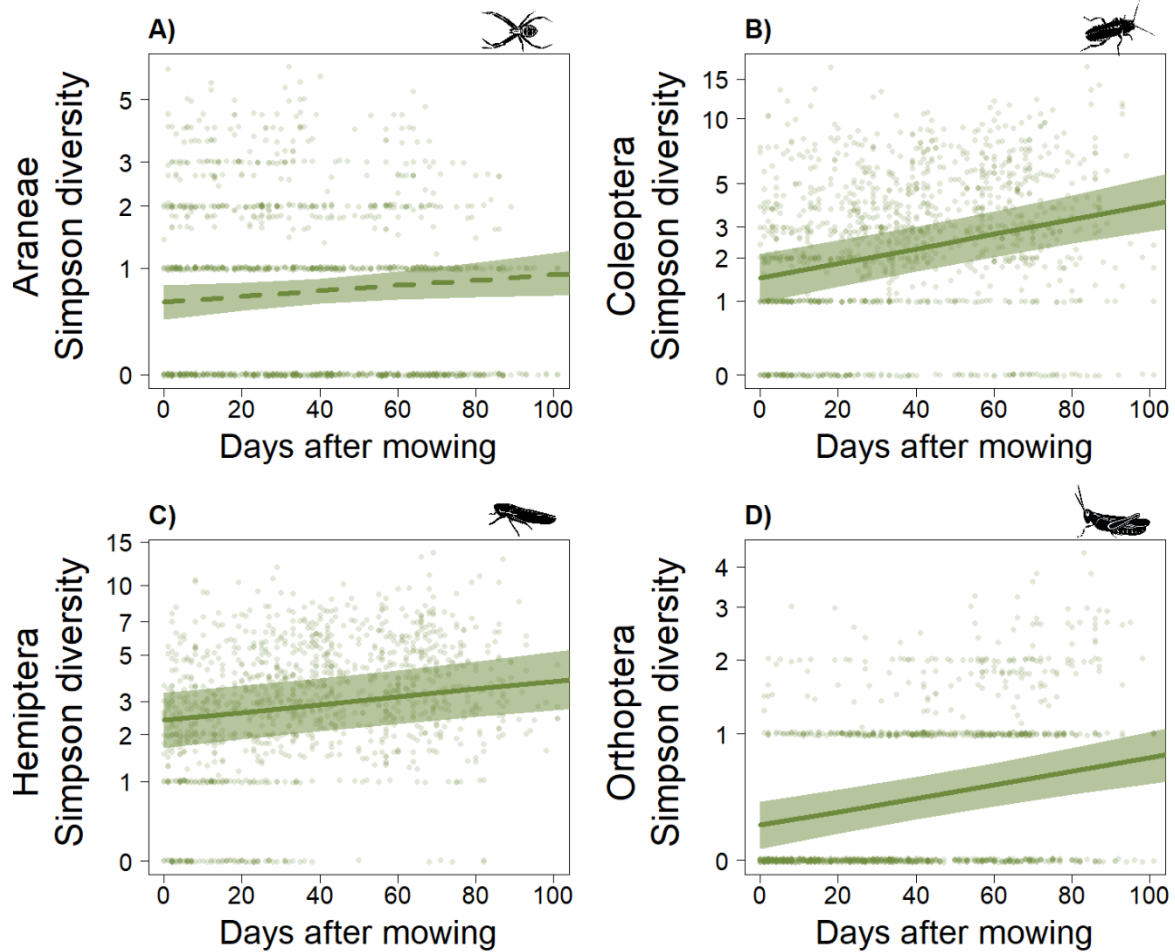| Response	Araneae				Coleoptera				Hemiptera				Orthoptera			
	Est.	*SE*	*z*	*p*	*Est.*	*SE*	*z*	*p*	*Est.*	*SE*	*z*	*p*	*Est.*	*SE*	*z*	*p*
Abundance	**0.890**	**0.026**	**33.686**	**<0.001**	**0.714**	**0.017**	**42.225**	**<0.001**	**0.616**	**0.018**	**33.475**	**<0.001**	**0.710**	**0.030**	**23.441**	**<0.001**
Days after mowing	-0.041	0.049	-0.844	0.399	**0.076**	**0.028**	**2.751**	**0.006**	**0.072**	**0.019**	**3.717**	**<0.001**	0.119	0.063	1.903	0.057
Width	-0.026	0.032	-0.835	0.404	-0.006	0.020	-0.295	0.768	-0.008	0.015	-0.534	0.593	-0.027	0.044	-0.614	0.539
Conditioner	-0.017	0.064	-0.270	0.787	-0.066	0.042	-1.545	0.122	-0.059	0.033	-1.769	0.077	-0.147	0.091	-1.611	0.107
Height	-0.012	0.031	-0.392	0.695	0.007	0.021	0.325	0.745	0.007	0.018	0.409	0.682	0.020	0.049	0.407	0.684
Julian day	0.461	0.662	0.697	0.486	**-0.870**	**0.354**	**-2.457**	**0.014**	**1.462**	**0.279**	**5.235**	**<0.001**	**3.865**	**1.019**	**3.792**	**<0.001**
Julian day^2	-0.488	0.668	-0.730	0.465	**0.812**	**0.353**	**2.303**	**0.021**	**-1.432**	**0.276**	**-5.191**	**<0.001**	**-3.415**	**0.990**	**-3.451**	**0.001**
Rolling	-0.044	0.029	-1.499	0.134	0.016	0.018	0.920	0.358	**-0.049**	**0.014**	**-3.481**	**<0.001**	0.052	0.043	1.215	0.224
Leveling	0.072	0.032	2.236	0.025	0.000	0.019	0.016	0.988	0.012	0.014	0.799	0.425	-0.081	0.047	-1.734	0.083
Cuts prev. year	-0.037	0.028	-1.310	0.190	0.011	0.015	0.741	0.459	-0.005	0.012	-0.394	0.694	0.031	0.037	0.842	0.400
Cuts	-0.004	0.041	-0.086	0.931	0.024	0.022	1.102	0.271	0.006	0.016	0.344	0.731	0.090	0.048	1.871	0.061
Fertilization	-0.049	0.033	-1.476	0.140	-0.025	0.021	-1.215	0.224	-0.004	0.017	-0.245	0.806	-0.097	0.051	-1.891	0.059
Grazing	-0.048	0.027	-1.767	0.077	-0.001	0.017	-0.067	0.947	-0.025	0.013	-1.895	0.058	0.019	0.041	0.453	0.650

Response	Araneae				Coleoptera				Hemiptera				Orthoptera			
	Est.	*SE*	*z*	*p*	*Est.*	*SE*	*z*	*p*	*Est.*	*SE*	*z*	*p*	*Est.*	*SE*	*z*	*p*
Temperature	-0.022	0.030	-0.727	0.467	0.018	0.020	0.901	0.368	0.024	0.015	1.633	0.102	0.022	0.044	0.504	0.614
Precipitation	0.039	0.032	1.235	0.217	-0.038	0.016	-2.307	0.021	-0.007	0.012	-0.561	0.575	0.044	0.040	1.112	0.266
Pairwise contrasts: mower types																
Mulcher – Rotary m.	0.115	0.267	0.429	0.898	**-0.522**	**0.162**	**-3.224**	**0.003**	-0.138	0.109	-1.266	0.399	-0.396	0.388	-1.018	0.547
Bar m. - Rotary m.	-0.116	0.364	-0.320	0.942	0.137	0.166	0.827	0.675	-0.286	0.140	-2.034	0.097	-0.437	0.716	-0.610	0.804
Bar m. - Mulcher	-0.231	0.448	-0.515	0.857	**0.659**	**0.230**	**2.871**	**0.011**	-0.147	0.177	-0.833	0.670	-0.041	0.810	-0.051	0.998

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Additional results
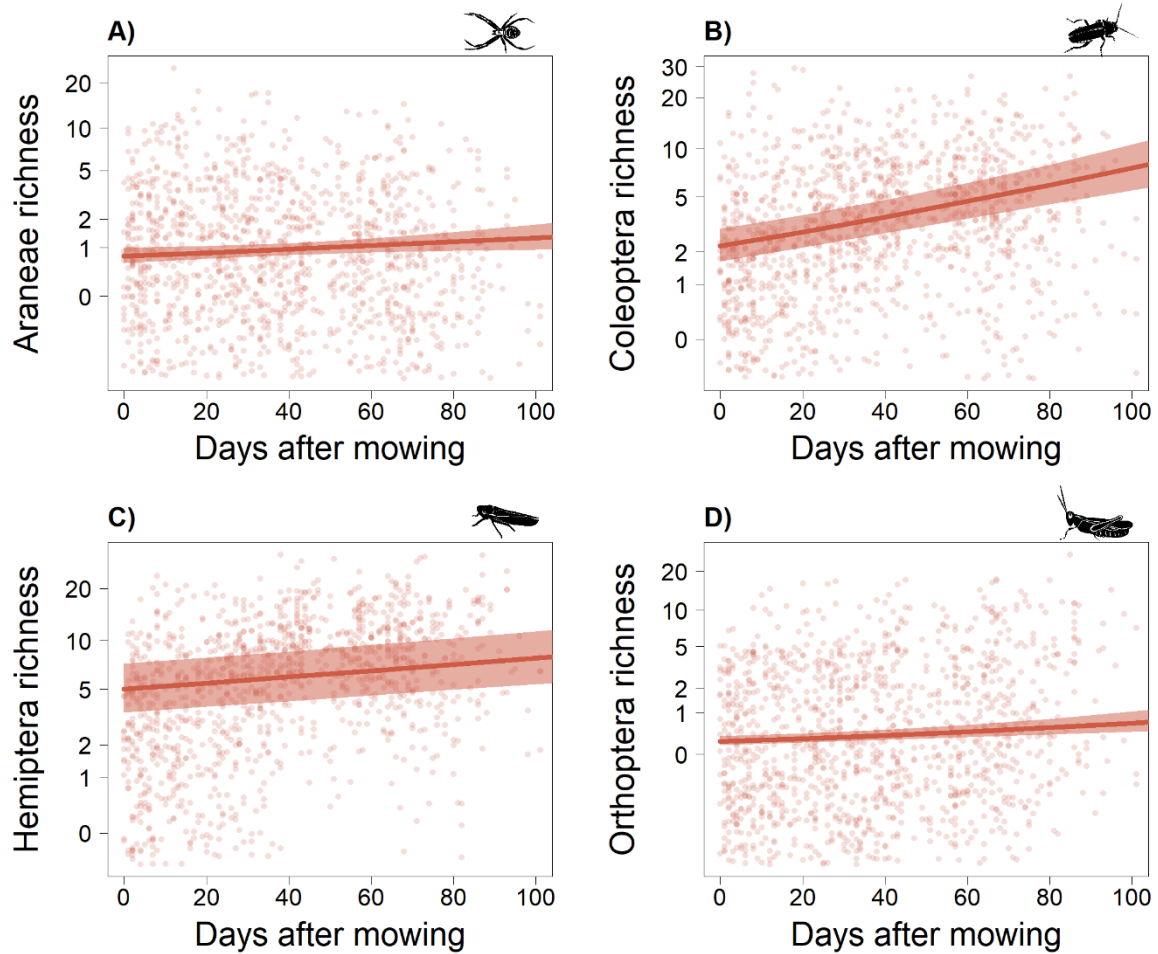
Figure S5: Raw species richness of A) Araneae, B) Coleoptera (negative binomial models), C) Hemiptera, and D) Orthoptera (generalized mixed models) in response to days between mowing and respective sampling dates (days after mowing). Sample size = 1,221. Models without accounting for abundance (see Output Table S3). Points display raw count values, and lines (dashed = non-significant, solid = significant after FDR correction) show model predictions accounting for all other covariates (shaded area marks 95% confidence intervals). For visualization, y-axes were log(x+1) transformed. All arthropod icons are illustrated by Johanna L. Berger.

Figure S6: Inverse Simpson diversity index of A) Araneae, B) Coleoptera, C) Hemiptera, and D) Orthoptera (linear mixed models) in response to days between mowing and respective sampling dates (days after mowing). Sample size = 1,221. Points display raw values, and lines (dashed = non-significant, solid = significant after FDR correction) show model predictions accounting for all other covariates (shaded area marks 95% confidence intervals). For visualization, y-axes were log(x+1) transformed. All arthropod icons are illustrated by Johanna L. Berger.
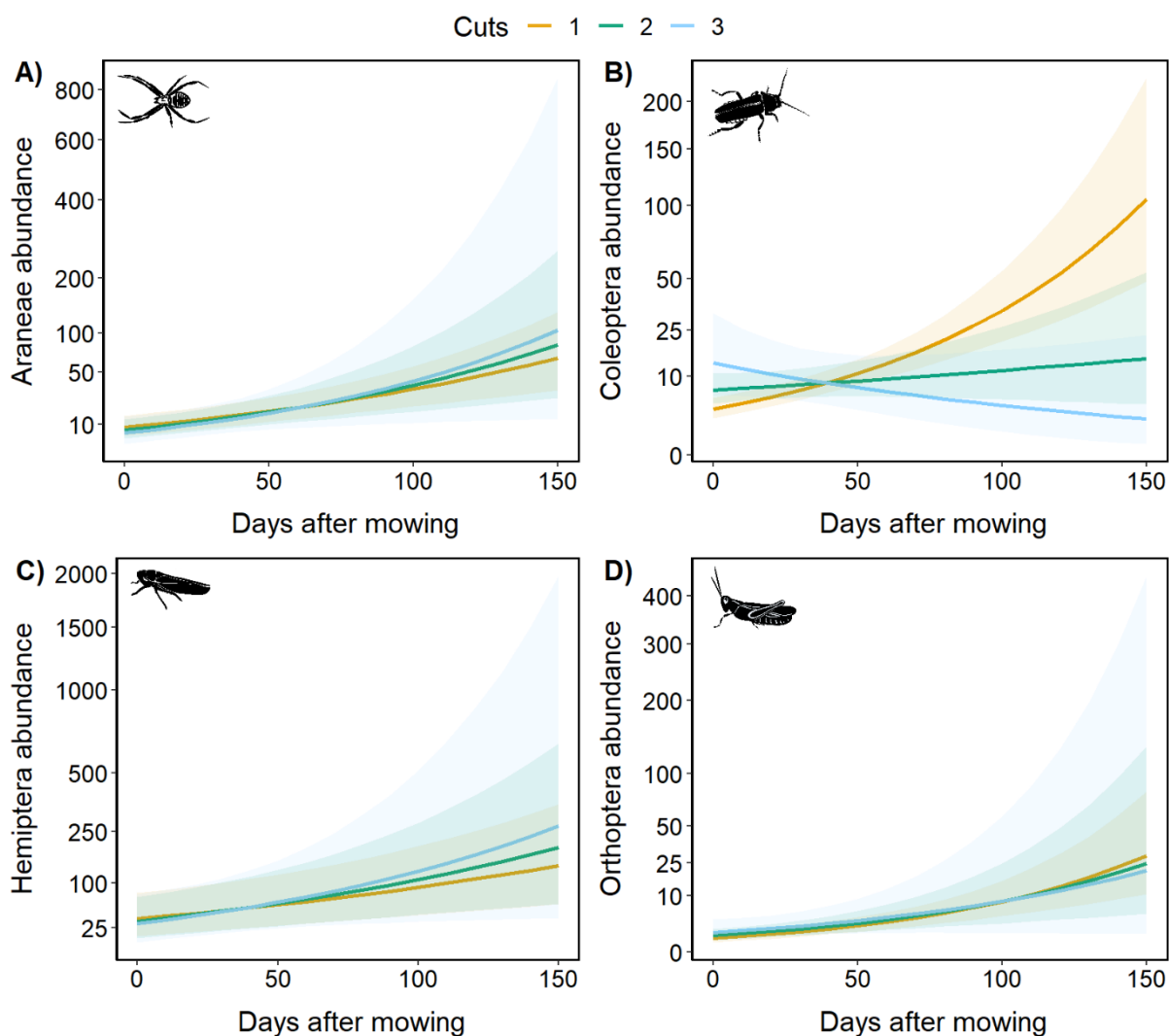
Figure S7: Abundance of A) Araneae, B) Coleoptera, C) Hemiptera, and D) Orthoptera (negative binomial models with interaction) in response to days between mowing and respective sampling dates (days after mowing) and number of cuts. Sample size = 1,516. Colors of prediction lines indicate number of cuts: 1 = orange, 2 = green, 3 = blue. The shaded area marks 95% confidence intervals. For visualization, abundances were square root transformed. Interaction between days after mowing and number of cuts was only significantly negative for Coleoptera (For model output see Table S5). All arthropod icons are illustrated by Johanna L. Berger.
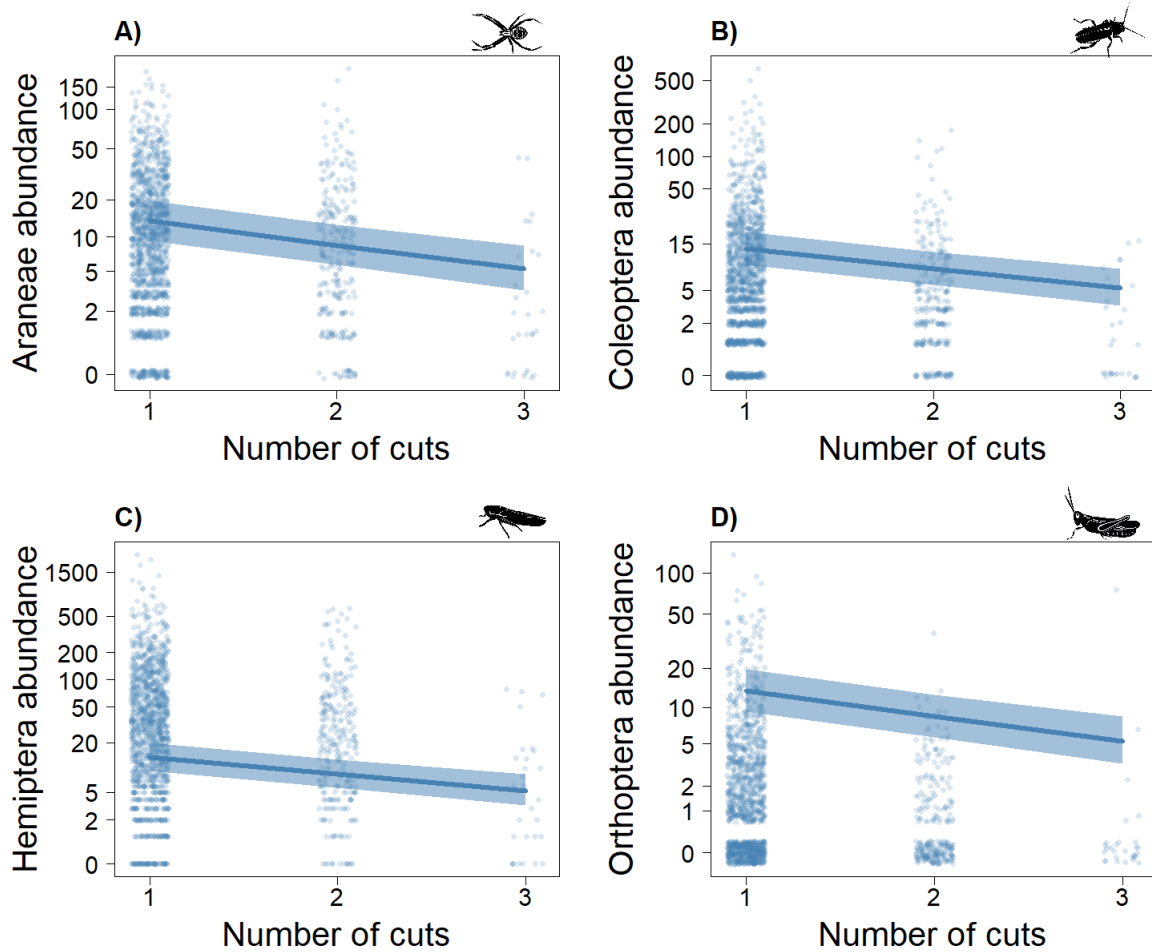
Figure S8: Abundance of A) Araneae, B) Coleoptera, C) Hemiptera, and D) Orthoptera (negative binomial models without 'days after mowing' variable) in response to the number of cuts (actual cuts before the sampling date). Sample size = 1,516. Points display raw count values, and lines (dashed = non-significant, solid = significant after FDR correction) show model predictions accounting for all other covariates (shaded area marks 95% confidence intervals). For visualization, y-axes were log(x+1) transformed. All arthropod icons are illustrated by Johanna L. Berger.

Table S3: Summary statistics (Estimate, Standard Error, z- and P-value) of two generalized mixed models (Araneae and Coleoptera) and two negative binominal models (Hemiptera and Orthoptera) with the raw species richness of each order as response variable (without including abundance as a covariate in the model, unlike Table S2). P-values were obtained from type II sums of squares and, for mower types, by Tukey's post hoc tests. Bold P-values indicate significance after FDR correction. Abbreviations used: Bar M. = Bar mower, Rotary M. = Rotary mower.

Response	Araneae				Coleoptera				Hemiptera				Orthoptera			
	Est.	*SE*	*z*	*p*	*Est.*	*SE*	*z*	*p*	*Est.*	*SE*	*z*	*p*	*Est.*	*SE*	*z*	*p*
Days after mowing	**0.138**	**0.060**	**2.305**	**0.021**	**0.316**	**0.044**	**7.131**	**<0.001**	**0.116**	**0.020**	**5.711**	**<0.001**	**0.270**	**0.065**	**4.149**	**<0.001**
Width	-0.008	0.042	-0.182	0.856	-0.073	0.030	**-2.397**	**0.017**	-0.005	0.020	-0.258	0.796	-0.002	0.050	-0.040	0.968
Conditioner	-0.066	0.089	-0.738	0.461	-0.065	0.069	-0.949	0.343	-0.065	0.039	-1.675	0.094	0.010	0.111	0.088	0.930
Height	-0.025	0.040	-0.620	0.535	0.025	0.032	0.786	0.432	0.012	0.022	0.528	0.597	0.074	0.055	1.338	0.181
Julian day	**3.781**	**0.785**	**4.815**	**<0.001**	**2.656**	**0.556**	**4.777**	**<0.001**	**2.481**	**0.280**	**8.872**	**<0.001**	**6.984**	**1.209**	**5.778**	**<0.001**
Julian day^2	**-4.292**	**0.792**	**-5.419**	**<0.001**	**-2.830**	**0.557**	**-5.084**	**<0.001**	**-2.266**	**0.276**	**-8.200**	**<0.001**	**-6.330**	**1.178**	**-5.374**	**<0.001**
Rolling	0.027	0.038	0.698	0.485	0.037	0.030	1.235	0.217	0.021	0.015	1.424	0.154	0.026	0.045	0.572	0.567
Leveling	-0.038	0.041	-0.932	0.351	0.016	0.030	0.516	0.606	-0.009	0.016	-0.564	0.573	-0.008	0.048	-0.158	0.874
Cuts prev. year	-0.034	0.034	-1.016	0.309	0.011	0.025	0.465	0.642	-0.006	0.012	-0.461	0.645	0.028	0.039	0.708	0.479
Cuts	0.048	0.048	0.998	0.318	0.034	0.034	1.006	0.314	-0.028	0.017	-1.627	0.104	0.053	0.053	0.999	0.318
Fertilization	-0.013	0.043	-0.297	0.767	-0.043	0.033	-1.314	0.189	-0.004	0.019	-0.201	0.841	-0.109	0.057	-1.916	0.055
Grazing	-0.029	0.037	-0.785	0.433	-0.020	0.027	-0.766	0.444	0.008	0.016	0.530	0.596	-0.070	0.047	-1.491	0.136
Temperature	-0.029	0.039	-0.730	0.465	0.062	0.032	1.928	0.054	**0.123**	**0.016**	**7.875**	**<0.001**	0.058	0.054	1.075	0.282
Precipitation	-0.063	0.038	-1.673	0.094	-0.040	0.027	-1.506	0.132	**-0.037**	**0.012**	**-3.013**	**0.003**	0.014	0.043	0.336	0.737

Response	Araneae				Coleoptera				Hemiptera				Orthoptera			
	Est.	*SE*	*z*	*p*	*Est.*	*SE*	*z*	*p*	*Est.*	*SE*	*z*	*p*	*Est.*	*SE*	*z*	*p*
Pairwise contrasts: mower types																
Mulcher - Rotary m.	-0.573	0.325	-1.762	0.173	**-0.941**	**0.262**	**-3.596**	**0.001**	**-0.336**	**0.134**	**-2.500**	**0.031**	-0.378	0.404	-0.936	0.601
Bar m. - Rotary m.	0.283	0.392	0.722	0.740	0.361	0.305	1.186	0.448	0.026	0.148	0.177	0.982	-0.986	0.721	-1.368	0.340
Bar m. - Mulcher	0.856	0.505	1.694	0.197	**1.303**	**0.397**	**3.283**	**0.003**	0.362	0.198	1.831	0.151	-0.607	0.823	-0.738	0.728

Table S4: Summary statistics (Estimate, Standard Error, z- and P-value) of the four linear mixed models with the inverse Simpson diversity index of Araneae, Coleoptera, Hemiptera and Orthoptera as response variables. P-values were obtained from type II sums of squares (Satterthwaite's method) and, for mower types, by Tukey's post hoc tests. Bold P-values indicate significance after FDR correction.

Response	Araneae				Coleoptera				Hemiptera				Orthoptera			
	Est.	*SE*	*z*	*p*	*Est.*	*SE*	*z*	*p*	*Est.*	*SE*	*z*	*p*	*Est.*	*SE*	*z*	*p*
Days after mowing	0.049	0.025	1.920	0.055	**0.181**	**0.031**	**5.860**	**<0.001**	**0.090**	**0.024**	**3.806**	**<0.001**	**0.098**	**0.018**	**5.318**	**<0.001**
Width	-0.014	0.019	-0.770	0.442	-0.037	0.022	-1.686	0.094	0.026	0.018	1.410	0.160	0.004	0.014	0.282	0.778
Conditioner	-0.016	0.041	-0.385	0.700	-0.082	0.049	-1.673	0.095	**-0.124**	**0.039**	**-3.216**	**0.001**	0.006	0.031	0.190	0.849
Height	-0.013	0.019	-0.698	0.487	-0.002	0.024	-0.086	0.931	0.019	0.020	0.993	0.322	0.012	0.015	0.768	0.444
Julian day	**1.200**	**0.328**	**3.657**	**<0.001**	**1.171**	**0.398**	**2.941**	**0.003**	**2.105**	**0.294**	**7.167**	**<0.001**	**0.745**	**0.229**	**3.248**	**0.001**
Julian day^2	**-1.411**	**0.329**	**-4.290**	**<0.001**	**-1.223**	**0.399**	**-3.063**	**0.002**	**-1.994**	**0.294**	**-6.774**	**<0.001**	**-0.650**	**0.230**	**-2.829**	**0.005**
Rolling	0.015	0.018	0.856	0.393	0.024	0.022	1.121	0.263	**-0.043**	**0.017**	**-2.578**	**0.010**	0.001	0.013	0.094	0.925
Leveling	-0.015	0.018	-0.835	0.404	0.028	0.021	1.301	0.194	-0.018	0.017	-1.085	0.278	0.002	0.013	0.186	0.853
Cuts prev. year	-0.009	0.015	-0.613	0.540	0.021	0.018	1.151	0.250	-0.003	0.014	-0.229	0.819	0.014	0.011	1.337	0.182
Cuts	0.012	0.020	0.592	0.554	0.018	0.024	0.740	0.459	-0.000	0.019	-0.003	0.998	0.016	0.015	1.117	0.264
Fertilization	-0.009	0.020	-0.469	0.639	-0.035	0.024	-1.458	0.146	0.017	0.019	0.902	0.367	-0.036	0.015	-2.382	0.018
Grazing	-0.011	0.017	-0.634	0.527	-0.026	0.020	-1.312	0.191	-0.017	0.016	-1.101	0.272	-0.020	0.013	-1.621	0.106
Temperature	-0.007	0.018	-0.394	0.693	**0.050**	**0.022**	**2.255**	**0.024**	**0.064**	**0.016**	**3.980**	**<0.001**	**0.025**	**0.013**	**1.971**	**0.049**
Precipitation	-0.020	0.016	-1.258	0.209	-0.026	0.019	-1.371	0.171	-0.028	0.014	-1.982	0.048	0.006	0.011	0.550	0.582

Response	Araneae				Coleoptera				Hemiptera				Orthoptera			
	Est.	*SE*	*z*	*p*	*Est.*	*SE*	*z*	*p*	*Est.*	*SE*	*z*	*p*	*Est.*	*SE*	*z*	*p*
Pairwise contrasts: mower types																
Mulcher - Rotary m.	-0.233	0.139	-1.676	0.203	**-0.644**	**0.166**	**-3.892**	**<0.001**	-0.175	0.127	-1.371	0.341	-0.128	0.100	-1.283	0.390
Bar m. - Rotary m.	0.147	0.203	0.724	0.739	0.358	0.242	1.483	0.285	0.010	0.184	0.053	0.998	-0.248	0.144	-1.718	0.187
Bar m. - Mulcher	0.380	0.243	1.565	0.248	**1.003**	**0.290**	**3.462**	**0.001**	0.184	0.221	0.833	0.670	-0.120	0.173	-0.692	0.758

Table S5: Summary statistics (Estimate, Standard Error, z- and P-value) of negative binominal models exploring interactions between days after mowing and number of cuts (Days Mow.: Cuts) with the abundance of Araneae, Coleoptera, Hemiptera and Orthoptera as response variables. P-values were obtained from type II sums of squares and, for mower types, by Tukey's post hoc tests. Bold P-values indicate significance after FDR correction.

Response	Araneae				Coleoptera				Hemiptera				Orthoptera			
	Est.	*SE*	*z*	*p*	*Est.*	*SE*	*z*	*p*	*Est.*	*SE*	*z*	*p*	*Est.*	*SE*	*z*	*p*
Days after mowing	**0.410**	**0.069**	**5.948**	**<0.001**	**0.535**	**0.086**	**6.253**	**<0.001**	**0.318**	**0.062**	**5.098**	**<0.001**	**0.697**	**0.118**	**5.904**	**<0.001**
Cuts	-0.010	0.066	-0.145	0.885	0.019	0.080	0.241	0.810	0.046	0.063	0.741	0.459	0.101	0.100	1.014	0.311
Cuts prev. year	**-0.123**	**0.040**	**-3.081**	**0.002**	-0.070	0.049	-1.419	0.156	-0.034	0.038	-0.895	0.371	-0.009	0.060	-0.150	0.881
Width	-0.023	0.061	-0.376	0.707	-0.148	0.075	-1.983	0.047	-0.049	0.059	-0.834	0.404	0.287	0.115	2.487	0.013
Conditioner	0.170	0.136	1.252	0.210	0.136	0.159	0.856	0.392	-0.119	0.127	-0.933	0.351	-0.264	0.239	-1.101	0.271
Height	-0.023	0.070	-0.325	0.745	-0.032	0.077	-0.424	0.672	-0.006	0.069	-0.087	0.931	-0.018	0.162	-0.112	0.911
Julian day	**-1.057**	**0.490**	**-2.158**	**0.031**	**1.898**	**0.587**	**3.234**	**0.001**	**2.500**	**0.438**	**5.707**	**<0.001**	**6.741**	**1.282**	**5.258**	**<0.001**
Julian day^2	**1.335**	**0.481**	**2.774**	**0.006**	**-2.358**	**0.579**	**-4.071**	**<0.001**	**-2.425**	**0.434**	**-5.581**	**<0.001**	**-8.417**	**1.372**	**-6.134**	**<0.001**
Rolling	0.042	0.053	0.804	0.421	0.086	0.063	1.357	0.175	**0.163**	**0.047**	**3.466**	**0.001**	0.088	0.080	1.110	0.267
Leveling	-0.002	0.053	-0.038	0.970	-0.052	0.062	-0.837	0.402	-0.021	0.049	-0.420	0.674	0.120	0.093	1.298	0.194
Fertilization	-0.141	0.067	-2.104	0.035	0.054	0.078	0.691	0.490	**-0.182**	**0.065**	**-2.800**	**0.005**	-0.078	0.117	-0.661	0.508
Temperature	**0.368**	**0.059**	**6.291**	**<0.001**	**0.265**	**0.074**	**3.597**	**<0.001**	**0.472**	**0.053**	**8.880**	**<0.001**	0.016	0.091	0.181	0.857
Precipitation	-0.070	0.042	-1.669	0.095	-0.025	0.050	-0.498	0.618	**-0.092**	**0.037**	**-2.458**	**0.014**	-0.030	0.066	-0.459	0.646
Days Mow.: Cuts	0.047	0.057	0.827	0.408	**-0.215**	**0.069**	**-3.129**	**0.002**	0.056	0.050	1.102	0.271	-0.047	0.083	-0.566	0.571

Table S6: Summary statistics (Estimate, Standard Error, z- and P-value) of negative binominal models with abundance of Araneae, Coleoptera, Hemiptera and Orthoptera as response variables, to explore the difference of running the same models as in the main analysis but omitting the variable 'days after mowing'. P-values were obtained from type II sums of squares and, for mower types, by Tukey's post hoc tests. Bold P-values indicate significance after FDR correction.

Response	Araneae				Coleoptera				Hemiptera				Orthoptera			
	Est.	SE	z	p	Est.	SE	z	p	Est.	SE	z	p	Est.	SE	z	p
Width	-0.013	0.041	-0.309	0.757	-0.040	0.052	-0.775	0.438	0.046	0.041	1.130	0.258	**0.212**	**0.076**	**2.767**	**<0.001**
Conditioner	-0.063	0.088	-0.717	0.473	-0.039	0.115	-0.340	0.734	-0.128	0.087	-1.474	0.140	-0.047	0.150	-0.314	0.754
Height	0.073	0.044	1.658	0.097	0.085	0.051	1.665	0.096	0.077	0.045	1.709	0.088	0.127	0.075	1.689	0.091
Julian day	**0.900**	**0.339**	**2.653**	**0.008**	**3.762**	**0.455**	**8.270**	**<0.001**	**3.449**	**0.321**	**10.759**	**<0.001**	**5.202**	**0.859**	**6.056**	**<0.001**
Julian day^2	-0.397	0.346	-1.146	0.252	**-3.736**	**0.466**	**-8.014**	**<0.001**	**-3.122**	**0.329**	**-9.491**	**<0.001**	**-6.184**	**0.911**	**-6.790**	**<0.001**
Rolling	0.033	0.038	0.873	0.383	0.049	0.046	1.059	0.290	**0.107**	**0.035**	**3.045**	**0.002**	0.113	0.058	1.950	0.051
Leveling	-0.028	0.037	-0.756	0.449	-0.015	0.047	-0.330	0.741	0.001	0.036	0.022	0.983	-0.018	0.060	-0.305	0.761
Cuts prev. year	-0.063	0.030	-2.121	0.034	-0.038	0.039	-0.978	0.328	-0.004	0.028	-0.125	0.900	0.052	0.046	1.124	0.261
Cuts actual	**-0.212**	**0.035**	**-6.095**	**<0.001**	**-0.262**	**0.046**	**-5.678**	**<0.001**	**-0.178**	**0.034**	**-5.314**	**<0.001**	**-0.223**	**0.057**	**-3.880**	**<0.001**
Fertilization	-0.031	0.042	-0.739	0.460	0.065	0.052	1.247	0.212	-0.041	0.042	-0.991	0.322	-0.064	0.068	-0.947	0.344
Grazing	-0.043	0.034	-1.282	0.200	-0.029	0.045	-0.650	0.516	0.044	0.033	1.330	0.183	**-0.146**	**0.062**	**-2.370**	**0.018**
Temperature	**0.251**	**0.044**	**5.765**	**<0.001**	**0.157**	**0.058**	**2.720**	**0.007**	**0.367**	**0.041**	**8.986**	**<0.001**	0.005	0.071	0.071	0.944
Precipitation	**-0.062**	**0.031**	**-1.999**	**0.046**	-0.001	0.041	-0.031	0.976	**-0.080**	**0.029**	**-2.727**	**0.006**	-0.078	0.047	-1.679	0.093

Pairwise contrasts: mower types

Response	Araneae				Coleoptera				Hemiptera				Orthoptera			
	Est.	SE	z	p	Est.	SE	z	p	Est.	SE	z	p	Est.	SE	z	p
Mulcher - Rotary m.	**-1.057**	**0.267**	**-3.952**	**<0.001**	-0.722	0.358	-2.018	0.100	**-0.865**	**0.245**	**-3.531**	**0.001**	-0.548	0.436	-1.256	0.403
Bar m. - Rotary m.	0.148	0.435	0.341	0.934	0.551	0.573	0.961	0.587	0.431	0.406	1.062	0.521	0.165	0.720	0.230	0.970
Bar m. - Mulcher	1.205	0.505	2.384	0.042	1.273	0.665	1.916	0.126	**1.296**	**0.469**	**2.764**	**0.014**	0.713	0.835	0.854	0.655

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