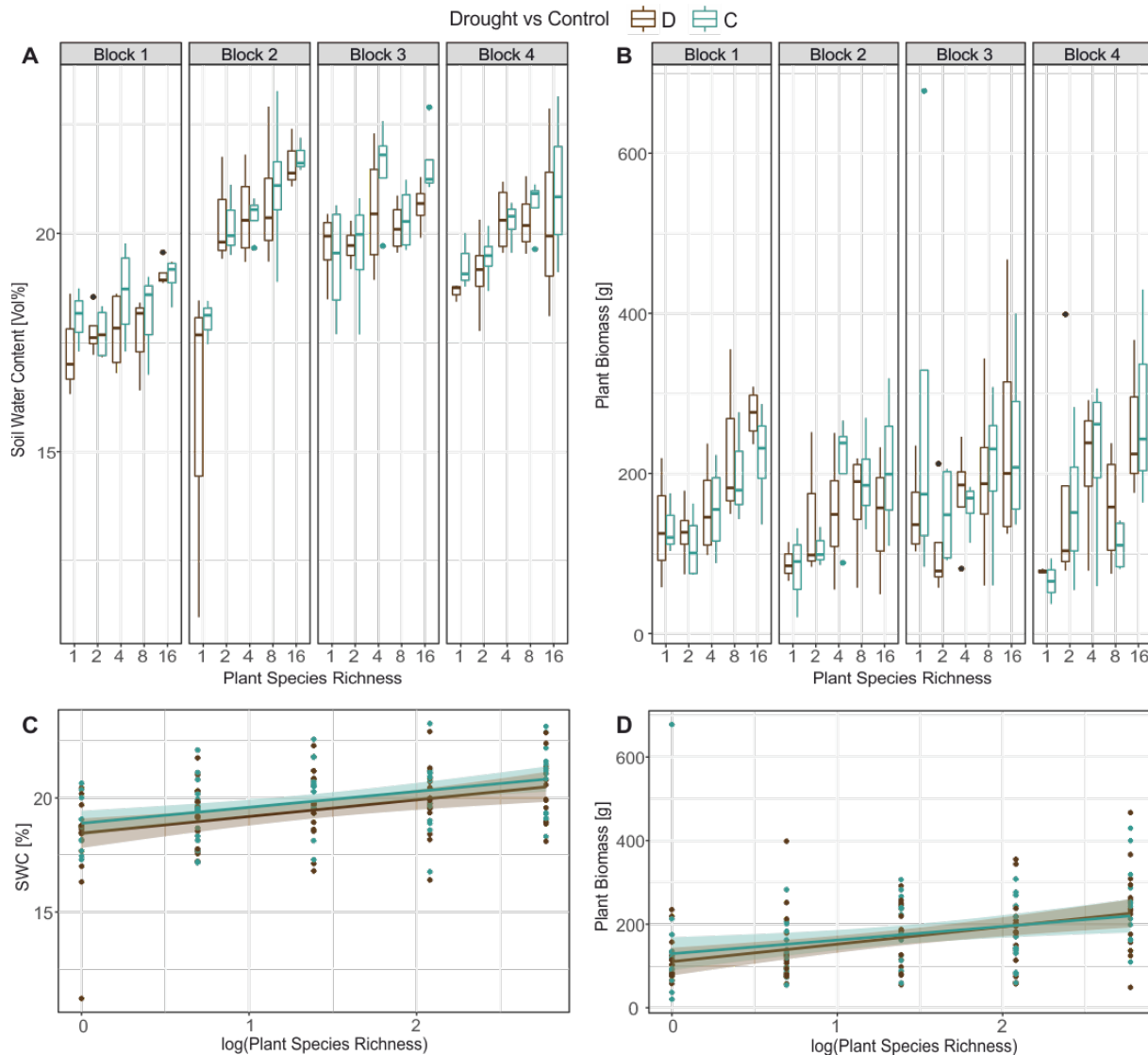
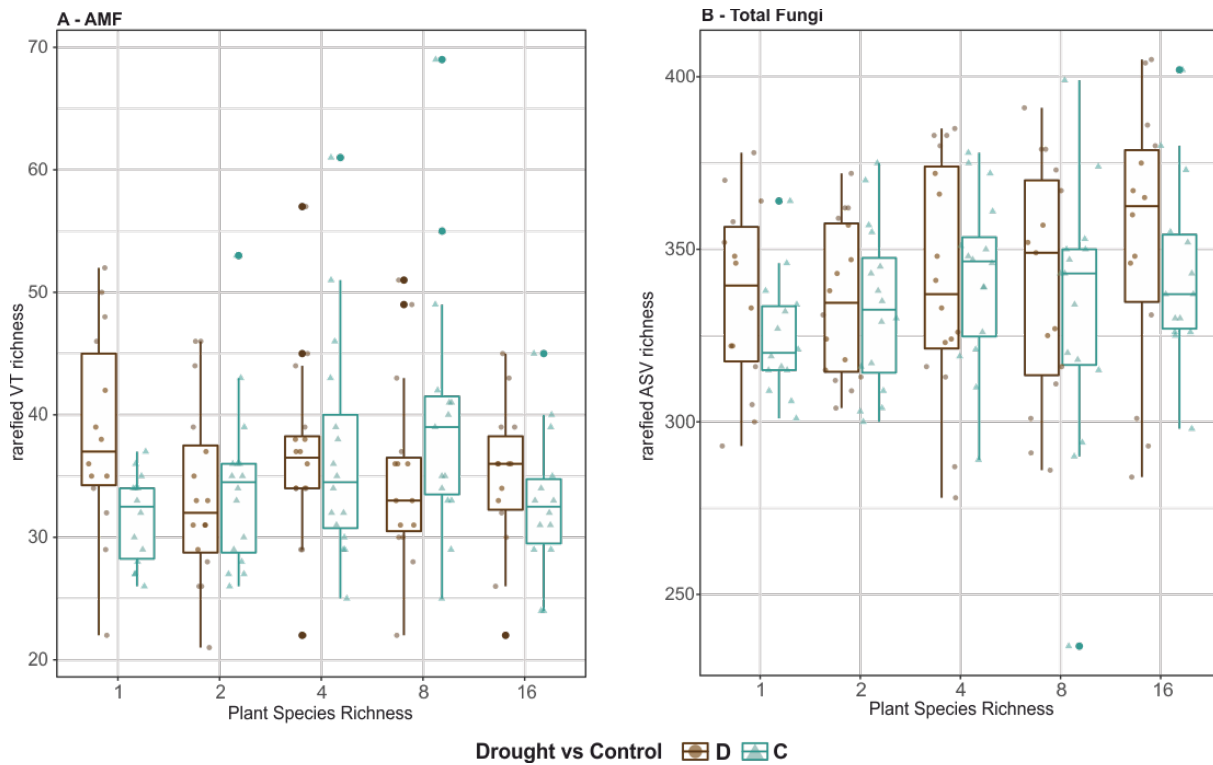


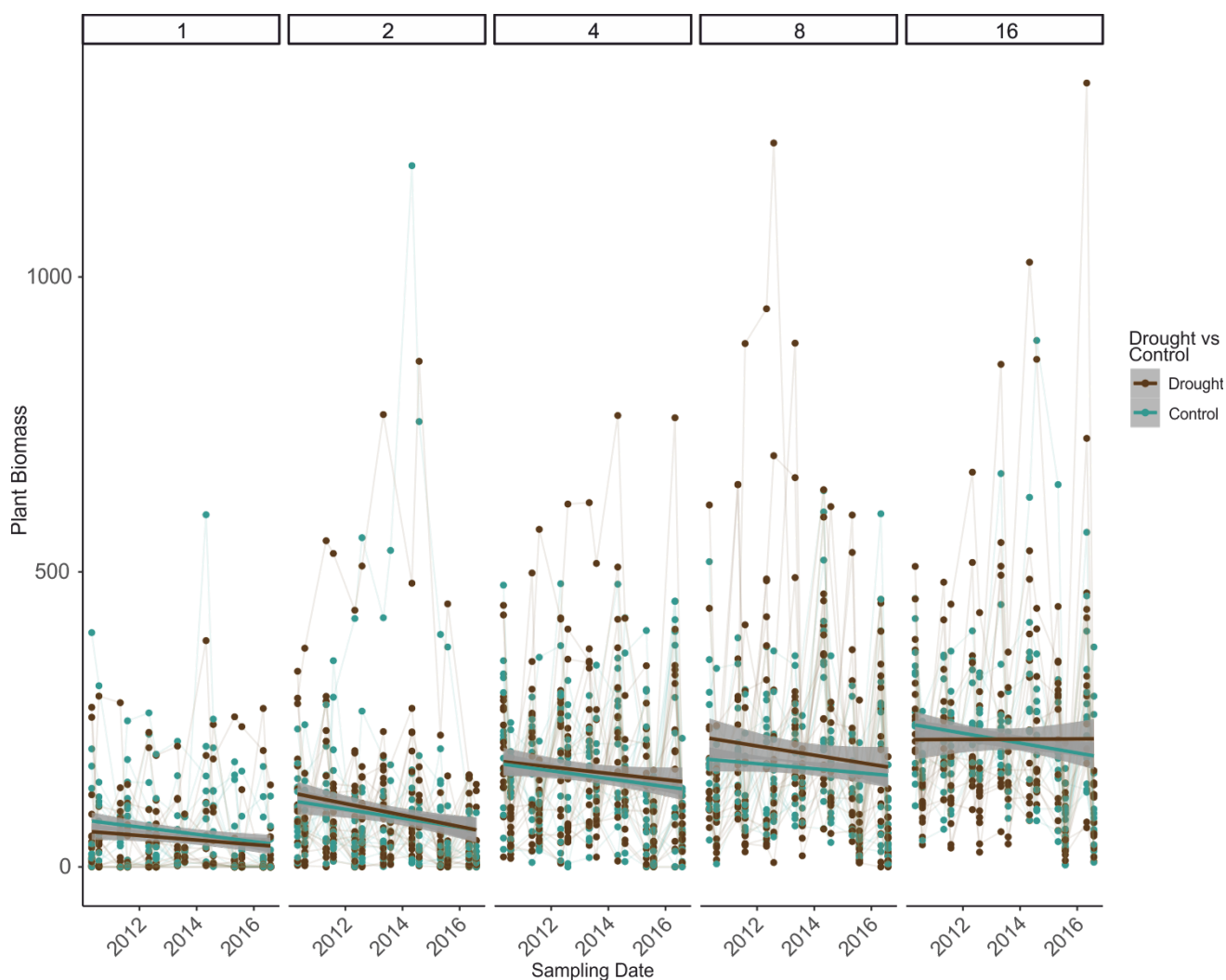
Supplementary Material



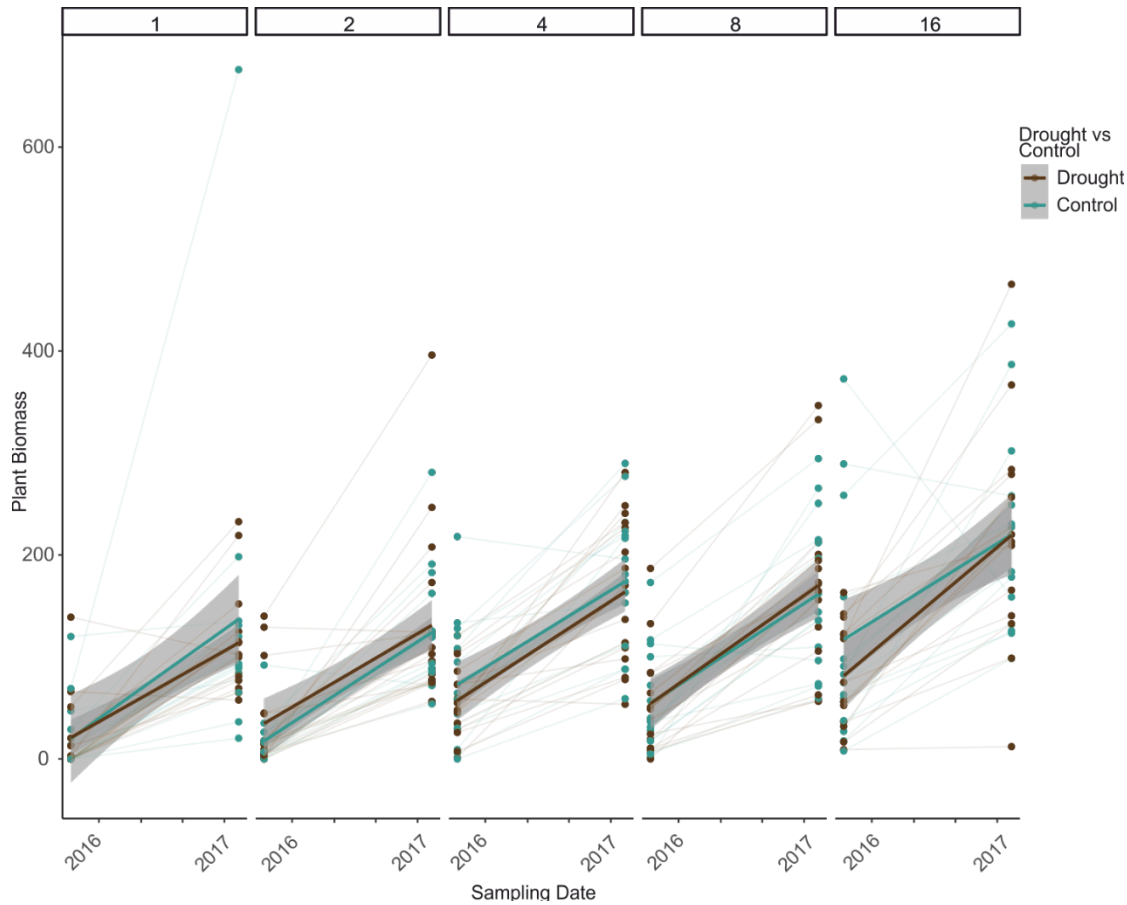
Supplementary Figure S1. Soil water content (SWC) and total plant biomass in control and drought exposed plots of different plant richnesses across the four field site blocks. Variation of soil water content (%) per block and plant species richness as boxplot (A) and linear model (C). Aboveground plant biomass (g) per block and plant species richness as boxplot (B) and linear model (D).



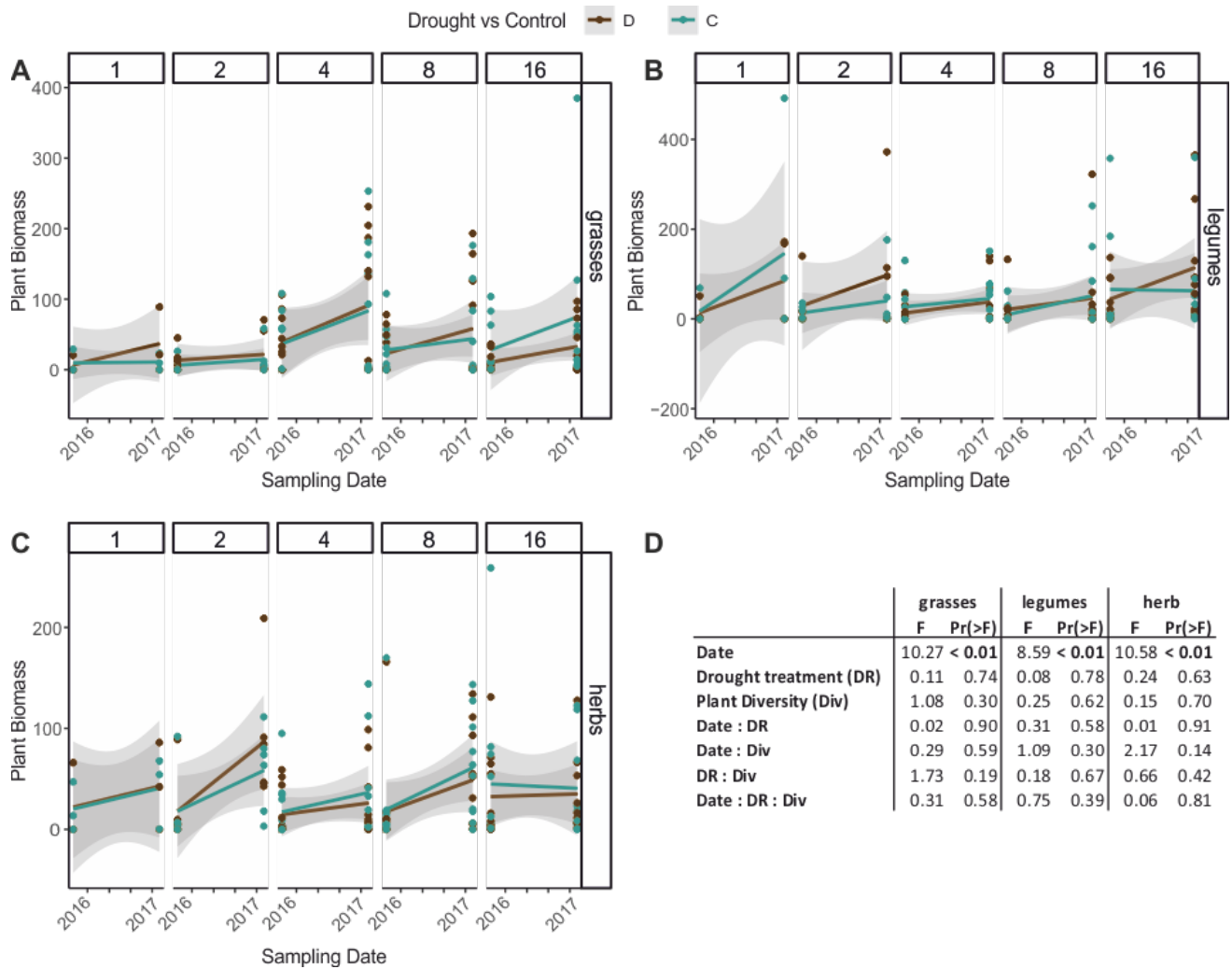
Supplementary Figure S2. alpha-diversity of AMF and total fungal communities according to plant species levels and treatments. (A) Observed AMF VT richness and (B) total fungal ASV richness after rarefaction, subdivided by plant species richness (1 – 16). Treatments: brown/circle – drought; teal/triangle – control subplots.



Supplementary Figure S3. Plant Biomass [g] of grassland communities under drought and ambient conditions over the years separated by plant diversity. Between 2010 and 2016 every May and August aboveground biomass was determined by cutting samples from a 0.1 m² subplot. The plant material was sorted into target species, weeds, and dead plant material, dried and weighed. Data points from the same plot are connected.



Supplementary Figure S4. Plant Biomass of grassland communities under drought and ambient conditions in August of the last of 8 consecutive years of drought treatments (2016) and August one year after the last treatment (2017). Aboveground biomass was determined by cutting samples from a 0.1 m² subplot. The plant material was sorted into target species, weeds, and dead plant material, dried and weighed.



Supplementary Figure S5. Plant Biomass of grassland communities by plant functional group under drought and ambient conditions in August of the last of 8 consecutive years of drought treatments (2016) and August one year after the last treatment (2017). Aboveground biomass was determined by cutting samples from a 0.1 m² subplot. The plant material was sorted into target species, weeds, and dead plant material, dried and weighed. A – biomass of grasses, B – biomass of legumes, C – biomass of herbs, D – results of ANOVAs to test for effects of the date, drought treatment and plant diversity on biomass of the plant functional groups.

Supplementary Table S1. Mean aboveground biomass of total plant biomass, grasses, legumes, and herbs under ambient (control) and drought conditions and results of paired t-test comparing biomass of drought to control.

	Mean biomass [g]		t.test	
	Drought	Control	T	p
Total Plant Biomass	167.76	174.23	-0.64	0.53
Grasses	27.46	28.50	-0.21	0.83
Legumes	37.13	31.40	0.63	0.53
Herbs	56.93	62.48	-0.89	0.37

Supplementary Table S2. ANOVA of drought effects and effects of plant community composition on soil water content (SWC) and aboveground plant biomass.

	SWC			Aboveground Plant Biomass		
	Df	F value	P value	Df	F value	P value
Drought Treatment	1	9.55	0.00	1	0.41	0.53
SWC	-	-	-	1	20.72	<0.01
Plot	74	8.07	<0.01	74	3.63	<0.01
Residuals	74			73		
Drought	Df	F value	P value	Df	F value	P value
Plant Diversity _{log}	1	12.12	<0.01	1	19.41	<0.01
Herbs _{P/A}	1	0.13	0.72	1	1.17	0.28
Grasses _{P/A}	1	0.49	0.48	1	2.35	0.13
Legumes _{P/A}	1	0.94	0.34	1	6.21	0.02
Block	3	8.73	<0.01	3	1.59	0.19
Residuals	67			67		
Control	Df	F value	P value	Df	F value	P value
Plant Diversity _{log}	1	22.49	<0.01	1	8.19	<0.01
Herbs _{P/A}	1	2.93	0.09	1	2.17	0.14
Grasses _{P/A}	1	2.42	0.12	1	0.69	0.41
Legumes _{P/A}	1	1.49	0.23	1	5.98	0.02
Block	3	16.29	<0.01	3	0.93	0.43
Residuals	67			67		

Supplementary Table S3. ANOVA of alpha-diversity (VT or ASV richness) in AMF and total fungi community as response to drought treatment and soil water content (SWC) stratified to plot, and as response to plant community composition stratified to block.

	AMF VT richness				Total fungi ASV richness			
	Df	F value	R²	P value	Df	F value	R²	P value
Drought Treatment	1	0.25	0.00	0.60	1	1.39	0.01	0.12
SWC	1	3.20	0.02	0.29	1	0.09	0.00	0.39
Residuals	149		0.99		149		0.99	
Drought	Df	F value	R²	P value	Df	F value	R²	P value
Plant Diversity _{log}	1	0.52	0.01	0.46		1.78	0.02	0.18
Herbs _{P/A}	1	0.78	0.01	0.39	1	2.45	0.03	0.12
Grasses _{P/A}	1	0.38	0.01	0.58	1	0.29	0.00	0.59
Legumes _{P/A}	1	0.73	0.01	0.39	1	5.33	0.07	0.02
Funct. Groups	3	2.27	0.03	0.17	3	0.72	0.01	0.40
Residuals	69		0.94		69		0.87	
Control	Df	F value	R²	P value	Df	F value	R²	P value
Plant Diversity _{log}	1	1.48	0.02	0.22	1	1.79	0.02	0.18
Herbs _{P/A}	1	5.08	0.07	0.02	1	0.94	0.01	0.32
Grasses _{P/A}	1	0.42	0.01	0.54	1	0.81	0.01	0.35
Legumes _{P/A}	1	0.18	0.00	0.72	1	3.34	0.04	0.08
Funct. Groups	3	0.06	0.00	0.89	3	0.47	0.01	0.50
Residuals	69		0.90		69		0.90	