

Supplementary data

Measuring fluorescence as a means to evaluate the physiological reaction to growth retardant applied to manage turf

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Supplementary tables

Table S1. **a.** Results of ANOVA analysis performed on turf quality traits (F-values with statistical significance of the main effect or interaction); **b.** Mean values and homogeneous group identification using Duncan's multiple comparisons of turf ratings.

Table S2. **(a.)** ANNOVA analysis and **(b.)** Mean values and homogeneous group identification using Duncan's multiple comparisons of height, biomass and chlorophyll index.

Table S3. **(a.)** Mean values and **(b.)** results of homogeneous group identification using Duncan's multiple comparison procedures for Chl a fluorescence parameters: F0, FM, FV, TFM, Area, F_v/F_m , F_0/F_m , RC_{ABS} , $(1-V_j)/V_j$ and PI.

Table S4. **(a.)** Eigenvector values of principal components calculated for a complete dataset and **(b.)** the loading weights of each dataset variable on each principal component

Figure S1. The correlation between grass height [cm] and clipped biomass [g/m²]. Circles mark varieties of perennial ryegrass (pr), squares- Kentucky bluegrass (Kb), and triangles- tall fescue (tf).

Table S1. a. Results of ANOVA analysis performed on turf quality traits (F-values with statistical significance of the main effect or interaction). **b.** Mean values and homogeneous group identification using Duncan's multiple comparisons of turf ratings.

a												
Variation factors and interaction	Visual merit				Density				Color			
	Spring		Autumn		Spring		Autumn		Spring		Autumn	
	1 w.	5 w.	1 w.	5 w.	1 w.	5 w.	1 w.	5 w.	1 w.	5 w.	1 w.	5 w.
Perennial ryegrass												
TE (A)	57.21*	60.15*	50.23*	64.74*	54.28*	52.54*	50.32*	51.76*	50.49*	47.35*	48.91*	50.34*
Varieties (B)	0.13	0.14	0.15	0.13	0.16	0.16	0.16	0.16	0.14	0.16	0.17	0.15
(A) x (B)	0.44	0.26	0.32	0.45	0.54	0.64	0.48	0.27	0.34	0.27	0.38	0.45
Kentucky bluegrass												
TE (A)	12.47*	11.35*	11.62*	14.21*	15.24*	15.16*	14.88*	14.92*	16.34*	18.41*	18.16*	16.24*
Varieties (B)	0.75	0.72	0.52	0.64	0.98	0.97	0.98	0.94	0.82	0.83	0.87	0.8
(A) x (B)	0.87	0.82	0.52	0.75	0.34	0.27	0.35	0.11	1.73	0.83	0.97	0.55
Tall fescue												
TE (A)	0.25	0.26	0.24	0.22	0.15	0.15	0.15	0.15	0.23	0.23	0.23	0.24
Varieties (B)	0.21	0.2	0.21	0.19	0.15	0.15	0.15	0.15	0.21	0.23	0.22	0.22
(A) x (B)	0.18	0.24	0.73	1.45	0.1	0.23	0.54	0.64	0.03	0.05	0.07	0.07
b												
(A) Treatment applied/ (B) Varieties	Visual merit				Density				Color			
	Spring		Autumn		Spring		Autumn		Spring		Autumn	
	1 w.	5 w.	1 w.	5 w.	1 w.	5 w.	1 w.	5 w.	1 w.	5 w.	1 w.	5 w.
Perennial ryegrass												
(A: Treatment)	Control	5.2B	4.9B	5.1B	4.6B	8.0B	7.9B	8.0B	8.0B	6.0B	5.7B	5.6B
	TE [1.5g/100m ²]	8.5A	8.5A	8.5A	8.6A	8.5A	8.5A	8.4AB	8.5A	8.3A	8.2A	8.1A
	TE [4.5g/100m ²]	8.6A	8.7A	8.6A	8.6A	8.6A	8.7A	8.6A	8.6A	8.4A	8.4A	8.3A
(B: Varieties)	Goalkeeper	7.5A	7.4A	7.4A	7.3A	8.4A	8.3A	8.4A	8.3A	7.6A	7.5A	7.4A
	Jackento	7.5A	7.3A	7.4A	7.2A	8.3A	8.3A	8.3A	8.3A	7.6A	7.4A	7.3A
	Top Gun	7.4A	7.4A	7.4A	7.3A	8.4A	8.4A	8.4A	8.4A	7.5A	7.4A	7.3A
Kentucky bluegrass												
(A: Treatment)	Control	7.7A	7.7A	7.7A	8.2A	7.9A	7.9A	7.9A	7.9A	7.6A	7.5AB	7.6A
	TE [1.5g/100m ²]	7.3A	7.2A	7.2A	8.0A	8.2A	8.1A	8.2A	8.3A	7.9A	8.0A	8.0A
	TE [4.5g/100m ²]	3.7B	3.4B	3.6B	3.7B	6.3B	6.3B	6.3B	6.9A	6.6A	7.3B	6.6B
(B: Varieties)	Award	6.3A	6.1A	6.2A	6.7A	7.5A	7.5A	7.5A	7.7A	7.3A	7.5A	7.4A
	Bluchip	6.2A	6.2A	6.2A	6.6A	7.5A	7.5A	7.5A	7.7A	7.4A	7.7A	7.5A
	Liberator	6.2A	6.2A	6.2A	6.6A	7.5A	7.4A	7.5A	7.7A	7.3A	7.6A	7.4A
Tall fescue												
(A: Treatment)	Control	8.6A	8.2A	8.4A	8.1A	8.8A	8.8A	8.8A	8.8A	9.0A	9.0A	8.9A
	TE [1.5g/100m ²]	8.8A	8.8A	8.8A	8.8A	8.8A	8.8A	8.8A	8.8A	8.9A	8.9A	9.0A
	TE [4.5g/100m ²]	8.7A	8.7A	8.7A	8.6A	8.8A	8.8A	8.8A	8.8A	8.9A	8.8A	8.8A
(B: Varieties)	Arid 3	8.7A	8.6A	8.7A	8.6A	8.8A	8.8A	8.8A	8.8A	8.9A	8.9A	8.8A
	Pixi	8.7A	8.6A	8.7A	8.5A	8.8A	8.9A	8.9A	8.9A	8.9A	8.9A	8.8A
	Stowell	8.7A	8.6A	8.6A	8.5A	8.8A	8.8A	8.8A	8.8A	8.9A	9.0A	9.0A

w. – weeks; * p<0.05

a												
Variation factors and interaction	Height [cm]				Biomass [g m ⁻²]							
	Spring		Autumn		Spring		Autumn					
	1 w.	5 w.	1 w.	5 w.	1 w.	5 w.	1 w.	5 w.				
Perennial ryegrass												
TE (A)	1044.14	985.53*	627.73*	876.63*	1044.72**	995.73	2766.01**					984.74*
Varieties	140.64*	106.32*	1.01	2.32	147.93*	101.84	41.81*					3.44
(A) x (B)	4.22*	4.50*	13.15*	2.72	4.05*	3.85*	14.79*					3.75
Kentucky bluegrass												
TE (A)	2366.05	986.82*	873.09*	785.02*	3166.76**	954.82	67.83*					1828.52**
Varieties	13.01*	6.32*	8.42*	0.54	14.52*	860.04	0.65					5.56
(A) x (B)	0.69	1.72	0.53	0.88	0.76	1.84	0.53					0.87
Tall fescue												
TE (A)	1008.76	21.85*	1098.76**	120.43*	1073.92**	121.32	56.81*					212.13*
Varieties	16.90*	2.5	987.09*	12.52*	34.52*	1.32	344.09*					15.02*
(A) x (B)	29.8*	5.1*	10.3*	33.8*	31.8*	5.8*	15.3*					34.0*
b												
(A) Treatmentt applied/ (B) Varieties	Height [cm]				Biomass [g/m ²]				Chl Index [0-999]			
	Spring		Autumn		Spring		Autumn		Sprin g		Autumn	
	1 w.	5 w.	1 w.	5 w.	1 w.	5 w.	1 w.	5 w.	1 w.	5 w.	1 w.	5 w.
Perennial ryegrass												
(A: Treatment)	11.7		11.1		63.8	11.9	35.7	29.5	381		286	
Control	A	6.5A	A	9.4A	A	B	A	A	A	131C	A	359B
TE [1.5g/100m ²]	8.0B	7.3A	8.4B	8.7B	B	C	B	B	317B	285B	A	364B
TE [4.5g/100m ²]	4.4C	7.0A	6.9C	7.2C	C	A	C	C	C	333A	221B	A
(B: Varieties)					37.2	12.4	24.2	27.4	330		271	496
Goalkeeper	7.9B	6.4B	8.3A	8.7A	A	A	A	A	A	254A	A	A
Jackento	8.1A	7.5A	8.8A	8.4A	A	A	A	A	A	248A	254B	A
Top Gun	8.5A	6.8B	9.2A	8.2A	A	A	A	A	A	247A	254B	A
Kentucky bluegrass												
(A: Treatment)					40.1		17.8	26.5	408		394	
Control	9.9A	6.2B	5.7A	8.7A	C	9.6A	A	A	A	196B	B	264A
TE [1.5g/100m ²]	4.2B	7.1A	4.1B	4.4B	B	A	12.7B	B	340B	430A	A	235B
TE [4.5g/100m ²]	3.8C	6.4B	3.5C	3.7C	A	8.0B	10.5C	7.3C	C	232B	A	174C
(B: Varieties)					21.4		14.6	15.9	368		379	
Award	5.1B	6.4B	4.7A	5.8A	A	9.2A	A	A	A	275B	A	229A
Bluchip	6.1A	6.2B	4.3B	5.5A	A	9.2A	A	A	A	268B	A	224A
Liberator	6.2A	7.1A	4.2B	5.5A	A	A	A	A	A	315A	A	220A
Tall fescue												

(A: Treatment)	13.6				57.3	10.7	10.7	36.9	363	232	394	
Control	A	5.4B	3.5A	8.5A	A	C	A	A	A	C	A	262A
TE [1.5g/100m ²]					27.0	14.2	10.0	14.4		456	408	
	6.9B	5.3B	3.3A	4.6B	B	B	A	B	302B	A	A	219B
TE [4.5g/100m ²]					26.5	18.0	10.9	15.8		302	344	
	7.4B	6.3A	3.6A	4.2B	B	A	A	B	319B	B	B	203C
(B: Varieties)					37.1	14.4		22.0		307	392	
Arid 3	9.0A	5.7A	3.2B	5.6B	B	A	9.7C	B	320B	A	A	224A
					33.5	14.4	11.7	23.3		346	355	
Pixi	8.2B	5.7A	3.8A	6.0A	C	A	A	A	326B	A	A	230A
				5.8A	40.5	14.0		21.9	339	345	398	
Stowell	9.8A	5.5A	3.3B	B	A	A	10.2B	B	A	A	A	229A

w. – weeks; * p<0.05; ** p<0.001

Table S3. a. Results of ANOVA analysis performed on chlorophyll index and Chl *a* fluorescence traits (F-values with statistical significance of the main effect or interactions). **b.** Mean values and results of homogeneous group identification using Duncan's multiple comparison of Chl *a* fluorescence parameters.

a												
Variation factors and interaction	Ch Index [0-999]				F ₀				F _M			
	Spring		Autumn		Spring		Autumn		Spring		Autumn	
	1 w.	5 w.	1 w.	5 w.	1 w.	5 w.	1 w.	5 w.	1 w.	5 w.	1 w.	5 w.
Perennial ryegrass												
TE (A)	81.72*	171.21*	99.56*	33.35*	31.05*	42.27*	2.62*	0.90	23.09*	63.43*	8.63*	6.18
Varieties (B)	0.25	0.89	67.12*	3.70	1.12	3.75	0.07	1.00	7.46*	23.09*	3.12	15.72
(A) x (B)	1.26	1.10	1.03	0.93	2.60*	8.53*	1.23	5.46*	2.76*	5.92*	0.38	1.08
Kentucky bluegrass												
TE (A)	206.62*	128.55*	15.74*	117.73*	47.02*	2.21	6.91	122.10*	4.11	10.10*	1.25	52.01*
Varieties (B)	12.35*	20.11*	0.75	3.31	0.56	6.92	0.64	14.83*	1.61	2.95	1.01	6.21*
(A) x (B)	3.14*	1.85	0.59	0.46	0.34	2.36	13.13*	3.75*	0.12	3.49*	16.74*	2.89*
Tall fescue												
TE (A)	28.88*	229.10*	6.90*	520.72*	1.10	2.26	0.27	11.34*	6.29	5.99	0.46	3.84
Varieties (B)	1.05	4.52	1.69	0.99	0.41	1.45	1.05	5.10	1.12	1.24	1.44	2.03
(A) x (B)	22.06*	1.52	54.42*	60.62*	6.43*	9.68*	7.01*	3.06*	3.24*	6.12*	5.63*	3.23*
Variation factors and interaction	F _v				T _{FM}				Area			
	Spring		Autumn		Spring		Autumn		Spring		Autumn	
	1 w.	5 w.	1 w.	5 w.	1 w.	5 w.	1 w.	5 w.	1 w.	5 w.	1 w.	5 w.
Perennial ryegrass												
TE (A)	30.08*	63.51*	10.29*	12.68*	66.65*	5.99	11.64*	24.12*	190.83*	17.68*	0.48	7.64*
Varieties (B)	9.62*	10.17*	8.67*	31.75*	17.2*	0.12	6.04	3.19	0.81	4.38	0.16	1.53
(A) x (B)	2.51	3.45*	0.83	0.44	2.39	4.03	1.03	7.49	2.57	8.34*	0.73	7.19*
Kentucky bluegrass												
TE (A)	4.37	7.99*	1.26	37.73*	256.51*	0.82	1.29	82.67*	109.84*	15.97*	2.00	20.35*
Varieties (B)	1.89	4.86	2.91	5.07*	1.00	162.70*	0.08	1.00	2.98	4.79	1.42	6.33
(A) x (B)	0.09	5.62*	16.63*	2.44	7.26	2.46	11.44*	1.92	1.05	0.49	30.46*	1.53
Tall fescue												
TE (A)	9.74*	1.44	0.52	4.05	7.40*	1.27	10.80*	12.40*	4.52	0.17	1.52	2.08
Varieties (B)	1.51	1.70	1.64	1.43	1.05	1.03	0.92	17.04*	0.93	0.57	1.07	0.43
(A) x (B)	38.7*	6.24*	5.37*	3.10*	10.83*	6.45*	4.91*	5.04*	25.9*	15.7*	0.59	3.28*
Variation factors and interaction	F _v /F _M				F ₀ /F _M				RC/ABS			
	Spring		Autumn		Spring		Autumn		Spring		Autumn	
	1 w.	5 w.	1 w.	5 w.	1 w.	5 w.	1 w.	5 w.	1 w.	5 w.	1 w.	5 w.
Perennial ryegrass												
TE (A)	51.84*	9.08*	5.95*	309.91*	51.94*	26.07*	8.54*	312.52*	68.43*	20.28*	29.48*	64.12*
Varieties (B)	1.46	2.20	36.13*	4.48	1.46	2.51	1.00	3.17	0.45	1.02	1.49	6.68
(A) x (B)	0.40	1.20	5.56*	4.43*	0.13	2.30	4.70*	3.48*	2.99*	1.76	2.23	11.07*
Kentucky bluegrass												
TE (A)	43.43*	3.83	12.19*	2.09	42.74*	4.74	20.16*	2.55	180.08*	59.87*	6.82	305.46*
Varieties (B)	1.00	33.30*	9.26*	1.00	2.84	23.60*	1.00	6.86	0.06	8.07*	1.00	19.66*
(A) x (B)	0.25	7.29*	6.19*	0.91	0.34	7.54*	5.12*	0.91	3.54*	3.76*	3.99*	1.90
Tall fescue												
TE (A)	39.15*	0.32	1.13	19.02*	36.14*	0.49	1.15	14.36*	9.57*	0.48	2.81	19.18*
Varieties (B)	0.08	5.17	75.85*	0.02	0.11	6.92	79.57*	0.59	14.15*	1.15	14.01*	65.06*
(A) x (B)	1.92	9.37*	8.78*	2.36	3.36*	9.94*	9.11*	2.21	6.3*	2.87*	2.65*	4.75*
Variation factors and interaction	(1-V _J)/V _J				PI _{ABS}							
	Spring		Autumn		Spring		Autumn		Spring		Autumn	
	1 w.	5 w.	1 w.	5 w.	1 w.	5 w.	1 w.	5 w.	1 w.	5 w.	1 w.	5 w.
Perennial ryegrass												
TE (A)	35.40*	3.45	122.73*	22.29*	84.24*	25.93*	23.45*		84.27*			
Varieties (B)	0.59	26.33*	1.71	5.42	0.73	2.5	3.54		40.81*			

(A) x (B)	1.74	1.53	2.00	1.71	1.63	1.66	2.94*	1.08
Kentucky bluegrass								
TE (A)	160.21*	14.79*	35.37*	18.78*	196.68*	27.16*	1.87	64.19*
Varieties (B)	9.94*	10.73*	2.24	10.68*	0.66	8.00*	24.83*	11.84*
(A) x (B)	5.76*	0.42	6.47*	3.20*	2.55*	4.07*	5.34*	1.79
Tall fescue								
TE (A)	0.53	0.03	18.31*	31.69*	12.35*	0.38	2.12	10.42*
Varieties (B)	0.91	0.03	2.51	10.46*	8.06*	1.02	18.47*	110.68*
(A) x (B)	8.76*	4.15*	5.27*	4.22*	4.61*	3.23*	2.57*	5.03*

b												
F ₀				F _M				F _V				
weeks:	Spring		Autumn		Spring		Autumn		Spring		Autumn	
	1 st	5 th	1 st	5 th	1 st	5 th	1 st	5 th	1 st	5 th	1 st	5 th
Perennial ryegrass												
(A: Treatment)												
Control	6490A	5215C	6641A	6331A	28706B	14133C	25998B	24081A	22216C	8918C	19357B	17749B
TE [1.5g/100m²]	5861B	6037B	5819AB	6440A	31090A	17374B	29295A	26117A	25230B	11336B	23475A	19677B
TE [4.5g/100m²]	5162C	6475A	5717B	5993A	26938C	19524A	24591B	28767A	21775A	13049A	18874B	22774A
(B: Varieties)												
Goalkeeper	5793A	5960A	6130A	6055A	28827AB	17772A	27460AB	24286A	23034AB	11812A	21330A	18230B
Jackento	5989A	5627A	6129A	6671A	30116A	15464B	24307B	28456A	24127A	9837A	18177B	21784A
Top Gun	5732A	6140A	5917A	6038A	27792B	17795A	28117A	26225A	22060B	11655A	22199A	20187AB
Kentucky bluegrass												
(A: Treatment)												
Control	6364A	6170A	4668A	5403B	26233A	19338B	21281A	24631A	19869A	13167A	16612A	19227A
TE [1.5g/100m²]	5317B	6503A	4932AB	5666A	27790A	22574A	23050A	25541A	22472A	16071B	18118A	19875A
TE [4.5g/100m²]	4713C	6248A	5373B	4772C	24114A	20159B	22492A	20326B	19400A	13910A	17119A	15553B
(B: Varieties)												
Award	5639A	6422A	5057A	4717B	27683A	21450A	23352A	21196B	22044A	15028A	18295A	16479B
Bluchip	5296A	6027A	4798A	5228B	25237A	20587A	20521A	24089A	19940A	14559A	15722A	18861A
Liberator	5459A	6472A	5117A	5896A	25217A	20034A	22950A	25212A	19758A	13561A	17833A	19316A
Tall fescue												
(A: Treatment)												
Control	5668A	6899A	4879A	5353A	24609B	22092A	19910A	26367A	18941B	15193A	15030A	21013A
TE [1.5g/100m²]	5728A	6204A	5233A	4076B	30493A	22443A	21813A	19700A	24764A	16238A	16579A	15623A
TE [4.5g/100m²]	5220A	5366A	5546A	5880A	28486AB	18949A	24433A	21791A	23266A	13583A	18886A	16111A
(B: Varieties)												
Arid 3	5425A	6413A	5096A	4496A	27637A	19336A	20295A	20825A	22211A	12923A	15199A	16329A
Pixi	5806A	6459A	4634A	5151A	29179A	20890A	21653A	23076A	23372A	16798A	17019A	17924A
Stowell	5385A	5597A	5928A	5463A	26772A	23258A	24207A	23958A	21387A	15295A	18278A	18494A

T _{FM}				Area				F _V /F _M				
weeks:	Spring		Autumn		Spring		Autumn		Spring		Autumn	
	1 st	5 th	1 st	5 th	1 st	5 th	1 st	5 th	1 st	5 th	1 st	5 th
Perennial ryegrass												
(A: Treatment)												
Control	310C	266A	427AB	848A	613066C	423721B	698206A	890529B	0.774B	0.631B	0.741B	0.733C
TE [1.5g/100m²]	661A	281A	497A	634B	940722A	536102A	774622A	857076B	0.811A	0.645AB	0.800A	0.747B
TE [4.5g/100m²]	566B	282A	353B	854A	814854B	555806A	741965A	1044414A	0.806A	0.663A	0.762AB	0.792A
(B: Varieties)												
Goalkeeper	508AB	276A	421AB	826A	775829A	508809A B	742267A	887054A	0.798A	0.659A	0.770B	0.746A
Jackento	493B	278A	470A	716A	792146A	455328B	750948A	973229A	0.800A	0.626A	0.747C	0.765A
Top Gun	535A	276A	385B	794A	800669A	551493A	721579A	931734A	0.792A	0.655A	0.787A	0.762A
Kentucky bluegrass												
(A: Treatment)												
Control	287C	271A	630A	461A	644553C	490679B	654115A	796769A	0.753B	0.669A	0.778A	0.774A
TE [1.5g/100m²]	424B	285A	694A	296B	812376A	648884A	789306A	660855B	0.807A	0.706A	0.784A	0.777A

TE [4.5g/100m²] (B: Varieties)	533A	273A	694A	289B	698695B	553039B	738579A	556870B	0.803A	0.683A	0.750B	0.762A
Award	391A	273B	676A	326A	758978A	569523A	736500A	548046B	0.793A	0.692A	0.782A	0.772A
Bluchip	466A	294A	673A	344A	702682A	579908A	667048A	731299A	0.787A	0.701A	0.756B	0.782A
Liberator	386A	262A	669A	375A	693964A	543171A	778509A	735149A	0.783A	0.665A	0.774A	0.759A

Tall fescue

(A: Treatment)													
TE	Control	313B	25A	700AB	582A	635993A	550757A	680102A	807914A	0.770B	0.684A	0.747A	0.792A
	[1.5g/100m²]	544A	263A	500B	465B	879294A	558463A	729413A	653208A	0.811A	0.717A	0.758A	0.790A
	TE [4.5g/100m²]	494A	347A	833A	407B	1004243A	602551A	1012018A	751843A	0.816A	0.712A	0.767A	0.739B
(B: Varieties)													
	Arid 3	485A	266A	583A	592A	861290A	555635A	690584B	733929A	0.800A	0.663A	0.736C	0.774A
	Pixi	454A	327A	750A	374C	902374A	637291A	868579A	715856A	0.800A	0.718A	0.784A	0.774A
	Stowell	412A	268A	700A	488B	755865A	518845A	861369A	763179A	0.797A	0.732A	0.753B	0.773A

	F ₀ /F _M				RC _{ABS}				(1-V _j)/V _j			
	Spring		Autumn		Spring		Autumn		Spring		Autumn	
weeks:	1 st	5 th	1 st	5 th	1 st	5 th	1 st	5 th	1 st	5 th	1 st	5 th

Perennial ryegrass

(A: Treatment)													
Control	0.774B	1.814C	3.017B	2.853C	1.301B	0.675B	1.212B	1.066C	0.654C	0.569A	0.656C	0.644C	
TE [1.5g/100m²]	0.811												
	A	1.933B	4.046A	3.108B	1.731A	0.736B	1.711A	1.241B	0.667B	0.594A	0.674B	0.655B	
TE [4.5g/100m²]	0.806												
	A	2.081A	3.311B	3.843A	1.851A	0.834A	1.586A	1.516A	0.685A	0.601A	0.701A	0.665A	
(B: Varieties)													
Goalkeeper	0.798												
	A	2.023A	3.479A	3.105A	1,623A	0.780A	1.564A	1.206A	0.672A	0.601A	0.694A	0.636A	
Jackento	0.800												
	A	1.808A	3.136A	3.346A	1.597A	0.732A	1.471A	1.274A	0.662A	0.581B	0.672A	0.627A	
Top Gun	0.792												
	A	1.997A	3.757A	3.352A	1.652A	0.733A	1.324A	1.342A	0.671A	0.581B	0.674A	0.633A	

Kentucky bluegrass

(A: Treatment)													
Control	3.181B	2.250A	3.546A	3.535A	1.279C	0.913B	1.415A	####C	0.662C	0.617B	0.612B	0.668B	
TE	4.208												
[1.5g/100m²]	A	2.570A	3.659A	3.560A	1.893B	1.108A	1.386A	1.800A	0.677B	0.646A	0.578C	0.706A	
TE	4.095												
[4.5g/100m²]	A	2.310A	3.150B	3.290A	2.056A	1.080A	1.592A	1.701B	0.701A	0.644A	0.644A	0.699A	
(B: Varieties)													
Award	3.947												
	A	2.420AB	3.615A	3.471A	1.747A	1.067AB	1.479A	1.616B	0.677A	0.645A	0.618A	0.679A	
Bluchip	3.831												
	A	2.540A	3.270B	3.620A	1.743A	1.120A	1.428A	1.905A	0.675A	0.644A	0.611A	0.712A	
Liberator	3.706												
	A	2.170B	3.469A	3.295A	1.738A	0.914B	1.488A	1.489B	0.688A	0.617B	0.606A	0.683A	

Tall fescue

(A: Treatment)													
Control	3.388B	2.321A	3.190A	3.862A	1.651B	0.991A	1.462A	1.987A	0.719A	0.644A	0.639A	0.707B	
TE	4.580												
[1.5g/100m²]	A	2.759A	3.166A	3.821A	2.191A	1.079A	1.691A	2.056A	0.714A	0.634A	0.678A	0.691C	
TE	4.453												
[4.5g/100m²]	A	2.579A	3.575A	2.922B	2.179A	1.223A	1.642A	1.635B	0.708A	0.635A	0.642B	0.729A	
(B: Varieties)													
Arid 3	4.075												
	A	2.043B	2.874C	3.618A	1.952B	0.964A	1.289B	2.069A	0.708B	0.641A	0.625A	0.728A	

	Pixi	4.080											
	A	2.789A	3.640A	3.488A	2.071A	1.208A	1.800A	1.795B	0.721A	0.638A	0.662A	0.703B	
	Stowell	4.000											
	A	2.828A	3.073B	3.499A	1.998AB	1.120A	1.674A	1.813B	0.712A	0.633A	0.672A	0.696B	
PIABs													
					Spring						Autumn		
weeks:			1 st		5 th			1 st			5 th		
Perennial ryegrass													
(A: Treatment)													
	Control			2.782B		0.759B		1.587C			2.782B		
	TE [1.5g/100m ²]			3.862A		0.916B		2.073A			3.862A		
	TE [4.5g/100m ²]			3.801A		1.176A		2.238B			3.801A		
(B: Varieties)													
		Goalkeeper		3.013A		1.051A		1.356A			3.013A		
		Jackento		2.738A		0.874A		2.431A			2.738B		
		Top Gun		3.065A		0.927A		2.108A			3.065A		
Kentucky bluegrass													
(A: Treatment)													
	Control			2.767B		1.437C		3.162A			3.702C		
	TE [1.5g/100m ²]			5.470A		1.996A		3.009A			4.649A		
	TE [4.5g/100m ²]			5.936A		1.788B		3.425A			4.120B		
(B: Varieties)													
		Award		4.931A		1.834A		3.386A			3.955B		
		Bluchip		4.643A		2.011A		2.999C			4.956A		
		Liberator		4.599A		1.371B		3.211B			3.559B		
Tall fescue													
(A: Treatment)													
		Control		4.039B		1.587A		2.948A			5.570A		
				6.796A		2.073A		3.700A			5.480A		
		TE [4.5g/100m ²]		6.916A		2.238A		3.664A			3.580B		
(B: Varieties)													
		Arid 3		5.724B		1.356B		2.389C			5.637A		
		Pixi		6.235A		2.431A		4.420B			4.427B		
		Stowell		5.791A		2.108A		3.501A			4.580B		

Table S4. a. Eigenvector values of principal components calculated for a complete dataset. **b.** The loading weights of each dataset variable on each principal component.

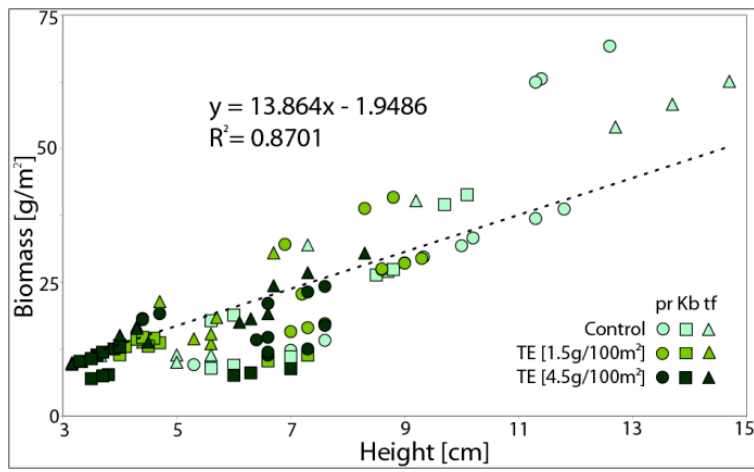


Figure S1. The correlation between grass height [cm] and clipped biomass [g/m²]. Circles mark varieties of perennial ryegrass (pr), squares- Kentucky bluegrass (Kb), and triangles- tall fescue (tf).