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**Genetics of post-drought recovery, persistence and summer dormancy in orchardgrass
(*Dactylis glomerata*)**

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Table S1. Information about orchardgrass genotypes used in this study

Genotype	Population code	origin
1	RCAT041111	Hungary
2	4000/44	Iran, Semnan
3	4000/31	Iran, Isfahan-Najafabad
4	RCAT041050	Hungary
5	RCAT041051	Hungary
6	RCAT041050	Hungary
7	4000/25	Iran, Isfahan-Fozve
8	4000/U-2	Iran, Kuhrang
9	4000/25	Iran, Isfahan-Fozve
10	4000/29	Netherland
11	RCAT041052	Hungary
12	4000/26	Iran, Isfahan-Fozve
13	4000/31	Iran, Isfahan-Najafabad
14	4000/24	Iran, Isfahan-Fozve
15	4000/44	Iran, Semnan
16	4000/25	Iran, Isfahan-Fozve
17	4000/24	Iran, Isfahan-Fozve
18	RCAT041052	Hungary
19	4000/2	Iran, Isfahan-Fozve
20	4000/44	Iran, Semnan
21	RCAT041122	Hungary
22	RCAT041111	Hungary
23	4000/2	Iran, Isfahan-Fozve
24	4000/31	Iran, Isfahan-Najafabad
25	RCAT041111	Hungary

Table S2. Analysis of variance for measured traits in 25 half-sib families of Orchardgrass evaluated at two moisture environment (normal and deficit irrigation) during years 2012-2014

Source of variation	Degree of freedom	Mean square							
		SPY	SUY	MDMY	CD	PH	PL	FLO	SD
E	1	116944.62**	22310.87**	60353.72**	250.41**	32.15**	15154.36**	7618.90**	2.15**
R/(E)	2	1677.14	151.82	694.72	0.27	1.27 ^{ns}	352.12**	48.37 ^{ns}	0.14
F	24	2547.23**	226.85**	837.00**	3.37**	16.34**	128.71**	99.49**	0.23**
F×E	24	3042.00**	423.97**	1285.85**	1.04 ^{ns}	4.33**	215.34**	38.92**	0.11*
F×R/(E)	48	1162.12**	271.61**	454.62**	0.94 ^{ns}	3.66**	129.30**	28.73*	0.17**
Y	2	18774.77**	99255.67**	37669.09**	1747.34**	335.12**	1581.77**	7189.89**	17.75**
Y×E	2	25294.11**	5222.26**	11553.39**	34.74**	15.06**	809.80**	4512.29**	0.05 ^{ns}
Y×R/(E)	4	1868.83**	700.44**	856.36**	0.64 ^{ns}	2.89 ^{ns}	80.05*	48.66*	0.20*
Y×F	48	1278.72**	218.60**	470.86**	1.21**	4.40**	39.46 ^{ns}	57.12**	0.11**
Y×F×E	48	865.51*	134.73 ^{ns}	273.01 ^{ns}	0.93 ^{ns}	1.86 ^{ns}	27.43 ^{ns}	49.32*	0.08 ^{ns}
Error	96	624.04	107.64	229.67	0.84	1.91	33.69	12.95	0.06

*: Significant at the 0.05 probability level, **: Significant at the 0.01 probability level, ns: non-significant.

E: moisture environment, R: replication, F: half-sib families, Y: year.

SPY Spring forage yield, SUY Summer forage yield, MDMY Mean dry matter yield, CD Crown diameter, PH Plant height, NS Number of stems per plant, PL Panicle length, FLO Flowering time, SD Summer dormancy

Table S3. General combining ability for measured traits of 25 half-sib families of orchardgrass used in this study under normal and deficit irrigation conditions

Under normal condition									
Genotype code	MDMY	CD	PH	NS	PL	FLO	SD	RY	Persis
1	-6.93	-3.16	2.04	21.75	-0.51	-3.73	0.43	-3.46	-42.02
2	23.40	12.03	9.02	25.35	1.06	-2.78	0.80	0.61	41.8
3	-42.65	-14.4	-14.73	-39.50	1.91	0.49	1.01	-3.46	-55.53
4	-3.30	-2.25	-0.39	-7.95	-0.38	-2.37	0.15	-2.96	-35.90
5	29.82	18.60	1.34	8.90	-0.36	0.53	-1.96	-0.39	8.31
6	13.67	3.60	-0.22	10.47	-1.05	0.47	-1.41	-0.41	22.22
7	25.73	8.60	4.78	11.16	-2.15	-2.87	-2.31	11.27	9.07
8	24.89	11.60	8.84	16.56	0.40	-1.13	-0.84	5.04	36.86
9	-9.35	-3.44	1.73	-9.06	-0.64	1.09	-0.82	0.25	13.36
10	16.76	-3.31	2.88	3.74	-1.34	0.22	0.15	0.49	29.80
11	34.14	29.60	12.84	26.35	0.82	4.82	-0.62	0.30	34.40
12	-28.11	-1.40	1.26	11.64	-0.69	-3.93	1.31	-2.96	-39.69
13	28.07	11.6	-2.59	-13.06	1.62	2.22	-1.30	7.15	6.78
14	17.29	-3.16	0.47	2.28	-0.15	-1.19	0.29	-3.06	-27.16
15	12.19	-3.87	8.21	-19.62	2.34	0.66	-1.50	3.18	2.93
16	8.92	-3.34	5.70	-5.71	0.11	-1.44	-0.56	-0.38	13.32
17	-23.83	-6.40	-8.15	14.27	-1.16	-4.23	1.55	0.89	32.86
18	-10.09	-4.40	-0.65	-25.50	2.02	-2.38	2.18	-1.96	-35.91
19	-22.74	-3.75	-5.03	-0.84	-1.04	3.43	1.16	-2.46	-47.31
20	-3.90	-2.59	-3.37	22.19	-0.66	5.21	0.82	2.21	20.36
21	-33.09	-8.40	-7.72	-7.31	-1.21	-2.40	1.02	-3.96	-24.54
22	3.08	2.60	-2.80	-2.60	0.47	2.16	0.41	-3.96	-14.51
23	-13.03	-3.66	10.70	-23.97	0.48	-0.55	1.34	-0.09	10.86
24	-16.59	-3.25	-3.45	13.15	0.34	4.45	-0.93	0.55	10.36
25	-14.23	-3.09	-4.67	-22.70	-0.19	3.33	-0.37	-0.98	29.36
Under deficit irrigation									
Genotype	MDMY	CD	PH	NS	PL	FLO	SD	RY	Persis
1	1.98	-5.01	-1.94	-2.31	0.04	1.33	-	-8.42	10.04
2	12.47	11.99	9.10	29.13	1.51	-0.05	-	11.58	19.04
3	-1.76	-6.01	-0.52	-5.12	2.97	2.30	-	-8.14	-5.96
4	8.88	2.99	-4.47	21.01	-2.03	-3.03	-	8.50	3.54
5	0.25	-7.01	-0.65	-2.62	-1.16	4.60	-	-6.64	-17.64
6	2.52	-2.01	4.19	0.70	-2.71	-2.25	-	-8.98	-43.93
7	11.47	10.99	9.01	24.96	-0.13	-1.72	-	-1.23	17.04
8	-7.12	-3.01	-5.78	-12.96	-1.34	-3.84	-	0.01	15.54
9	-4.03	-0.01	-4.50	-9.42	-0.24	-0.80	-	-6.42	-7.79
10	-0.14	-5.81	-3.38	-5.80	-1.18	-0.72	-	-8.85	14.04
11	14.47	12.99	10.01	41.16	1.35	3.55	-	2.31	8.04
12	-4.25	-7.01	2.57	-0.56	-1.17	-3.45	-	-9.58	-19.41
13	4.60	9.99	1.01	4.40	1.35	-0.16	-	-5.92	14.54
14	-7.30	-1.01	-8.96	-17.39	-0.41	-2.76	-	4.69	13.04
15	6.47	6.99	5.33	8.09	0.74	-2.15	-	-4.78	16.04
16	-8.11	-5.01	-0.71	0.59	0.02	-2.24	-	10.63	3.04
17	-3.42	-8.01	-2.09	4.80	-1.08	-2.19	-	-0.17	-4.46
18	5.85	4.99	9.83	-16.12	-0.35	-5.79	-	-10.94	-54.45
19	3.90	2.99	3.34	2.58	0.46	1.40	-	-10.58	-51.28
20	-8.44	-4.87	-3.65	-13.63	0.52	8.14	-	-1.42	10.04
21	6.25	9.99	3.41	21.92	-0.73	-4.24	-	-9.79	-49.95
22	-4.49	0.99	-2.47	-6.70	-0.88	0.80	-	10.76	-4.90
23	-6.41	-1.01	2.65	-14.15	0.77	-0.36	-	-4.08	3.54
24	-12.39	-9.01	-9.88	-28.46	3.17	11.85	-	11.74	18.04
25	-5.13	-4.91	-6.12	-3.99	0.68	1.92	-	13.92	19.04

MDMY Mean dry matter yield, CD Crown diameter, PH Plant height, NS Number of stems per plant, PL Panicle length, FLO Flowering time, SD Summer dormancy, RY Recovery yield, Persis Persistence

Table S4. Principal component loadings for the traits measured on 25 half-sib families under normal and deficit irrigation conditions

Characters	Normal		Deficit irrigation	
	PC1	PC2	PC1	PC2
Spring forage yield (g/plant)	0.42	0.07	0.37	0.16
Summer forage yield (g/plant)	0.31	0.38	0.36	0.12
Mean dry matter yield (g/plant)	0.43	0.12	0.43	0.20
Crown diameter (cm)	0.37	0.04	0.37	0.30
Plant height (cm)	0.31	0.22	0.39	0.08
Number of stems per plant	0.24	-0.31	0.29	-0.06
Panicle length (cm)	-0.28	0.44	-0.11	0.60
Flowering time	0.08	0.18	-0.24	0.45
Summer dormancy	-0.01	0.60	-	-
Recovery yield	0.29	-0.23	-0.22	0.34
persistence	0.30	-0.16	-0.18	0.48
Eigenvalue	4.8	1.68	4.57	1.73
Percent of variation	43.72	15.34	45.73	17.33
Cumulative percentage	43.72	59.06	45.73	63.06