Supplementary Table S1. Summary of trait means for the groups of standard genotypes (STA) F4:5 families (FAM) and parental genotypes (PAR)

Traits measured before defoliation

Season	STA	FAM	PAR	Season	STA	FAM	PAR
	Days to flowering				Flag leaf area (SPAD unit)		
2011	1377a	1393a		2011	471b	516a	
2012	1378b	1400b	1448a	2012	536a	539a	525a
2011/12	1378a	1396a		2011/12	504b	528a	
	Flag leaf area (cm^{-2})				Stem height (cm)		
2011	248b	281a		2011	762a	727a	
2012	357a	359a	298b	2012	632a	635a	595a
2011/12	303b	320a		2011/12	697a	681a	
	Peduncle length (cm)				Peduncle share (%)		
2011	327a	322a		2011	429a	443a	
2012	326a	338a	338a	2012	515b	532b	580a
2011/12	327a	330a		2011/12	464a	488a	
	Peduncle extrusion (cm)				Penultimate length (cm)		
2011	141a	127a		2011	213a	203a	
2012	159a	172a	173a	2012	174a	178a	170a
2011/12	150a	149a		2011/12	193a	191a	
	Penultimate share (%)				Stem specific weight ($mg\ cm^{-1}$)		
2011	279a	280a		2011	351b	412a	
2012	275a	281a	285a	2012	278b	300a	311a
2011/12	277a	281a		2011/12	315b	356a	

Traits measured at full maturity

	Control plants				Defoliated plants		
Season	STA	FAM	PAR	Season	STA	FAM	PAR
	Number of spikelets per main spike						
2011	194bA	207aA		2011	194bA	205aA	
2012	181aA	183aA	185aA	2012	180aA	182aA	184aA
2011/12	188aA	195aA		2011/12	187aA	193aA	
	Number of grains per spikelet						
2011	263aA	285aA		2011	260bA	287aA	
2012	190aA	185aA	197aA	2012	188aA	191aA	196aA
2011/12	227aA	235aA		2011/12	224aA	236aA	
	Stem reserve mobilization efficiency (%)						
2011	243aB	231aB		2011	391aA	388aA	
2012	247aB	278aB	288aB	2012	332aA	374aA	385aA
2011/12	245aB	255aB		2011/12	362aA	381aA	
	Harvest index (%)						
2011	512aA	493aA		2011	499aA	512aA	
2012	403aA	392aA	384aA	2012	341aB	340aB	342aB
2011/12	464aA	451aA		2011/12	429aB	439aA	

Means of genotype group followed by the same letter (lower case) within same row and treatment are not significantly different ($P < 005$) Means of genotype group in control and defoliated plants followed by the same letter (upper case) within same row are not significantly different ($P < 005$)

Supplementary Table S2. Classification matrix of linear discriminant analysis applied to 61 genotypes classified in STA. FAM and PAR groups for traits recorded in 2012

Control plants	STA	FAM	PAR	% correct
STA	10	6	1	588
FAM	3	23	1	852
PAR	2	1	14	824
Total	15	30	16	770
Defoliated plants				
STA	11	5	1	647
FAM	3	23	1	852
PAR	1	2	14	824
Total	15	30	16	787

Supplementary Table S3. Eigenvalues, cumulative variance and canonical discriminant functions (dimensions) standardized by within variances of linear discriminant analysis (LDA) for traits of for CP and DP plants recorded in 2012. Values in bold indicate traits mainly contributing to the classification at a specific dimension

Control plants	Dimension1	Dimension1
FLA	**0979**	-0387
PDS	**-0877**	0092
DTM	-0451	**-0590**
GWS	-0368	**0796**
Eingenvalues	1345	0138
Cumulative var (%)	0907	1000
Defoliated plants		
FLA	**-1045**	0310
PDS	**0916**	-0129
BMS	0468	**-0579**
SSI	0403	**-0922**
Eingenvalues	1415	0279
Cumulative var (%)	0835	1000

FLA = flag leaf area, PDS = peduncle share, DTM = days to maturity, GWS = grain weight/spike, BMS = biomass/main stem, SSI = stress susceptibility index

Supplementary Table S4. Comparison of Stress Susceptibility Index (SSI) and Stress Tolerance Index (STI) of genotypes as a response to different post-anthesis stress stage in 2011 (11) and 2012 (12)

Genotype	SSI 11	SSI12	STI11	STI12
MRI 87/A	1.337	1.723	0.537	0.327
MRI 87/B	1.166	1.015	0.609	1.202
MRI 7	0.562	0.375	0.893	1.067
MRI DK 1	1.645	0.374	0.604	1.127
MRI DK 2	1.086	1.514	1.003	0.790
MRI DK 3	1.802	1.832	0.565	0.871
15HRWYT/07-224	1.701	0.604	0.782	1.064
Pobeda	1.095	0.818	0.467	0.446
Renesansa	0.755	1.170	0.609	0.991
Zemunska rosa 1	1.644	0.238	0.568	0.899
Apache	1.382	1.434	0.529	0.743
Zemunska rosa 2	0.900	1.566	1.170	0.552
MRI AU 15	1.275	0.152	0.706	0.787
ZP Olga	1.175	2.320	1.044	0.721
MRI 146	1.196	1.244	0.683	1.075
MRI 162	1.200	1.284	0.884	0.895
MRI 165	1.061	1.160	1.155	0.675
MRI S3/I	0.197	0.240	0.972	0.383
MRI S4/I	1.443	1.576	1.396	0.875
MRI S7/I	0.657	1.032	0.611	0.925
MRI S10/I	1.386	0.122	0.315	0.463
MRI S10/II	0.255	0.634	1.538	0.655
MRI S11/I	0.665	2.399	1.007	0.237
MRI S12/I	0.319	0.822	1.265	0.797
MRI S134/I	0.349	0.375	0.581	0.624
MRI S134/II	0.708	0.511	0.866	0.753
MRI S268/I	0.134	1.161	0.626	0.476
MRI D1/I	1.248	1.528	0.718	0.470
MRI D3/I	0.875	0.796	0.965	0.793
MRI D6/I	1.315	1.331	0.616	0.581
MRI D10/I	1.421	0.390	0.744	0.907
MRI D10/II	1.469	0.355	0.992	0.724
MRI D11/II	0.890	0.256	1.073	0.575
MRI D12/I	0.327	1.614	1.023	0.506
MRI D14/I	1.334	0.927	0.788	1.120
MRI D16/I	1.240	1.709	1.316	1.290
MRI D18/II	0.949	0.148	0.662	0.710
MRI D19/I	0.213	0.639	1.098	0.985
MRI D20/IP	0.691	0.954	0.679	0.757
MRI D20/IH	1.116	0.939	0.956	0.643
MRI D21/I	0.843	0.282	1.157	1.137
MRI D22/I	0.475	0.533	1.212	0.816
MRI D25I	1.246	0.578	1.094	0.553
MRI D28/I	1.547	1.722	0.877	0.452
L1		0.778		0.534
L1/91		1.893		1.549

Donska semidwarf	1.555	0.827
Mexico 3	0.476	0.501
Avalon	0.431	0.835
Brigant	0.821	0.531
Highbury	1.996	0.442
NS 46/90	1.152	0.453
WWMBC2	0.280	0.581
NS 74/95	0.231	0.992
Benni multi-fl.	1.127	0.456
ZGKT 159/82	0.455	0.800
Lambriego Inia	1.042	0.629
Florida	1.511	0.695
Phoenix	0.334	0.878
Bezostaya 1	0.763	1.416
Mironovska 808	1.108	1.410

Note: a lower SSI indicates greater tolerance to stress; a higher STI indicates greater tolerance to stress