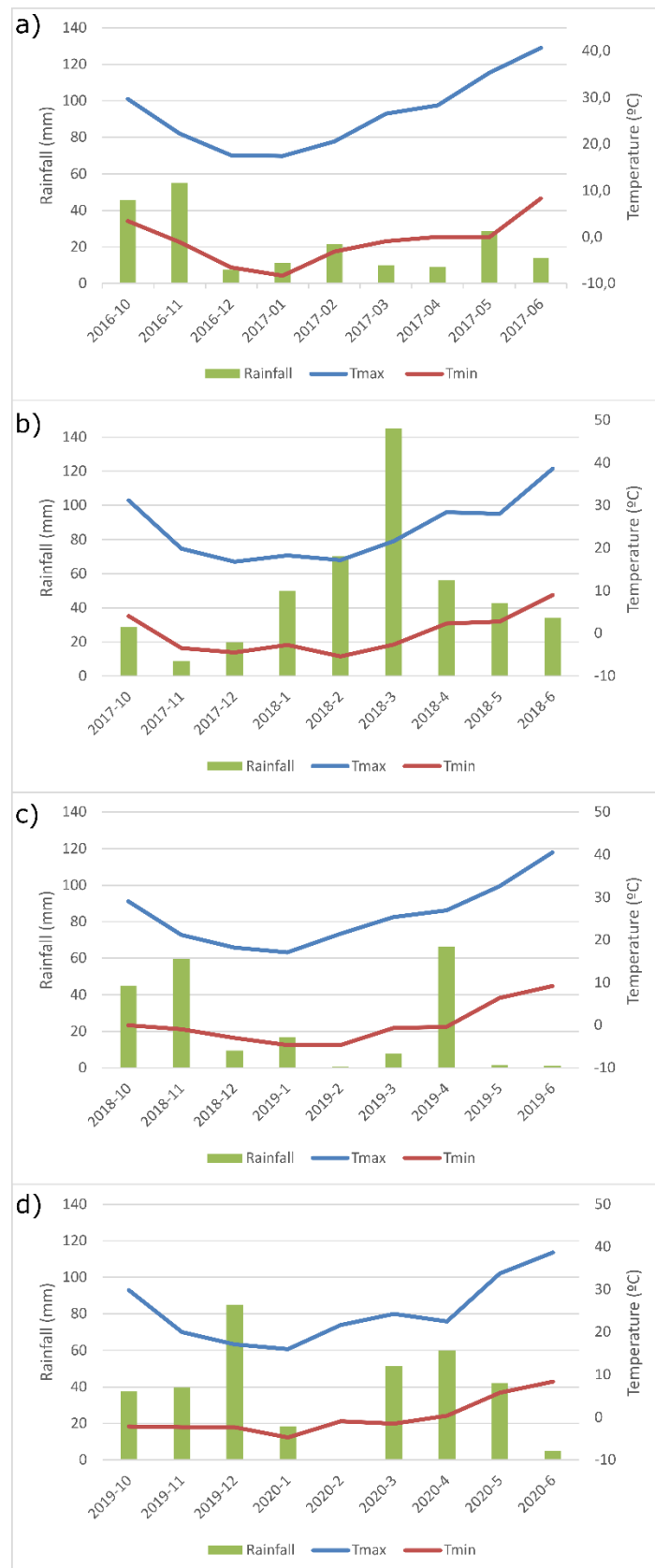


**Figure S1.** Alignment of Puroindoline b predicted protein sequence for each allele. Polymorphism characteristic of each allele is highlighted.



**Figure S2.** Monthly rainfall (mm) and mean maximum (Tmax, T°C) and minimum (Tmin, T°C) temperature recorded from October to June at the field trial sites during (a) 2016-2017, (b) 2017-2018, (c) 2018-2019 and (d) 2019-2020.

**Table S2.** Spearman's correlation among (A) traits, and (B) years for Thousand Kernel Weight (TKW), Grain Protein Content (GPC), Grain Number (GN) and SDS Sedimentation test (SDSS)

(A)				
	GPC	SDSS	TKW	GN
GPC	1			
SDSS	0.074	1		
TKW	-0.716	-0.225	1	
GN	-0.255	0.319	0.098	1

(B)				
GPC	2016/2017	2017/2018	2018/2019	2019/2020
2016/2017	1			
2017/2018	0.435	1		
2018/2019	0.468	0.359	1	
2019/2020	0.446	0.337	0.577	1

SDSS	2016/2017	2017/2018	2018/2019	2019/2020
2016/2017	1			
2017/2018	0.739	1		
2018/2019	0.777	0.645	1	
2019/2020	0.846	0.762	0.791	1

TKW	2016/2017	2017/2018	2018/2019	2019/2020
2016/2017	1			
2017/2018	0.501	1		
2018/2019	0.430	0.354	1	
2019/2020	0.568	0.569	0.475	1

GN	2016/2017	2017/2018	2018/2019	2019/2020
2016/2017	1			
2017/2018	-	1		
2018/2019	-	0.395	1	
2019/2020	-	0.472	0.431	1

**Table S3.** Mean, standard deviation and F values for the effect of the *Glu-1* loci on the SDS Sedimentation test values (SDSS, mm)

	allele	SDSS (mm)		F value
		mean	sd	
<i>Glu-A1</i>	<i>a</i>	52.14	± 22.00	***
	<i>b</i>	45.63	± 21.52	
	<i>c</i>	50.91	± 21.10	
	<i>y</i>	50.61	± 17.11	
<i>Glu-B1</i>	7*+9	71.93	± 25.91	***
	<i>a</i>	54.23	± 17.39	
	<i>al</i>	53.50	± 25.47	
	<i>am</i>	46.17	± 12.05	
	<i>aq</i>	49.77	± 19.65	
	<i>d</i>	44.70	± 14.52	
	<i>e</i>	39.84	± 16.99	
	<i>f</i>	57.92	± 20.13	
	<i>i</i>	77.00	± 22.09	
	<i>u</i>	56.71	± 21.58	
<i>Glu-D1</i>	<i>a</i>	50.60	± 20.06	***
	<i>c</i>	39.09	± 18.69	
	<i>d</i>	68.44	± 28.58	
	<i>l</i>	35.75	± 12.65	

\* 0.05 > p > 0.05; \*\* 0.05 > p > 0.005; \*\*\* p < 0.005; ns: non significant.

**Table S4.** Wilcox test for *Glu-A1*, *Glu-B1* and *Glu-D1* alleles

<i>Glu-A1</i>	<i>a</i>	<i>b</i>	<i>c</i>	<i>y</i>
<i>a</i>	-			
<i>b</i>	**	-		
<i>c</i>	ns	*	-	
<i>y</i>	ns	***	ns	-

<i>Glu-B1</i>	7*+9	<i>a</i>	<i>al</i>	<i>am</i>	<i>aq</i>	<i>d</i>	<i>e</i>	<i>f</i>	<i>i</i>	<i>u</i>
7*+9	-									
<i>a</i>	ns	-								
<i>al</i>	ns	ns	-							
<i>am</i>	*	ns	ns	-						
<i>aq</i>	ns	ns	ns	ns	-					
<i>d</i>	***	ns	ns	ns	ns	-				
<i>e</i>	***	**	ns	ns	ns	ns	-			
<i>f</i>	ns	ns	ns	ns	ns	*	***	-		
<i>i</i>	ns	ns	ns	*	*	**	***	ns	-	
<i>u</i>	ns	ns	ns	ns	ns	ns	***	ns	ns	-

<i>Glu-D1</i>	<i>a</i>	<i>c</i>	<i>d</i>	<i>l</i>
<i>a</i>	-			
<i>c</i>	***	-		
<i>d</i>	**	***	-	
<i>l</i>	*	ns	**	-

\* 0.05 > p > 0.05; \*\* 0.05 > p > 0.005; \*\*\* p < 0.005; ns: non significant.

**Table S5.** Mean and standard deviation of SDS Sedimentation test (mm) values for *Glu-1* alleles' combination

Allele's combination	N	mean	sd
<i>a:d:a</i>	5	45.28	± 12.06
<i>a:e:a</i>	10	40.39	± 17.79
<i>b:7*+9:d</i>	3	90.21	± 24.57
<i>b:a:a</i>	4	51.06	± 17.08
<i>b:e:a</i>	37	43.93	± 18.37
<i>b:e:c</i>	29	31.58	± 9.83
<i>b:f:a</i>	5	58.48	± 17.76
<i>b:u:a</i>	7	64.36	± 19.49
<i>b:u:d</i>	3	46.75	± 16.15
<i>c:d:a</i>	3	38.50	± 8.28
<i>c:u:a</i>	14	47.11	± 19.32
<i>y:e:a</i>	4	40.97	± 14.53
<i>y:f:a</i>	19	56.90	± 17.68

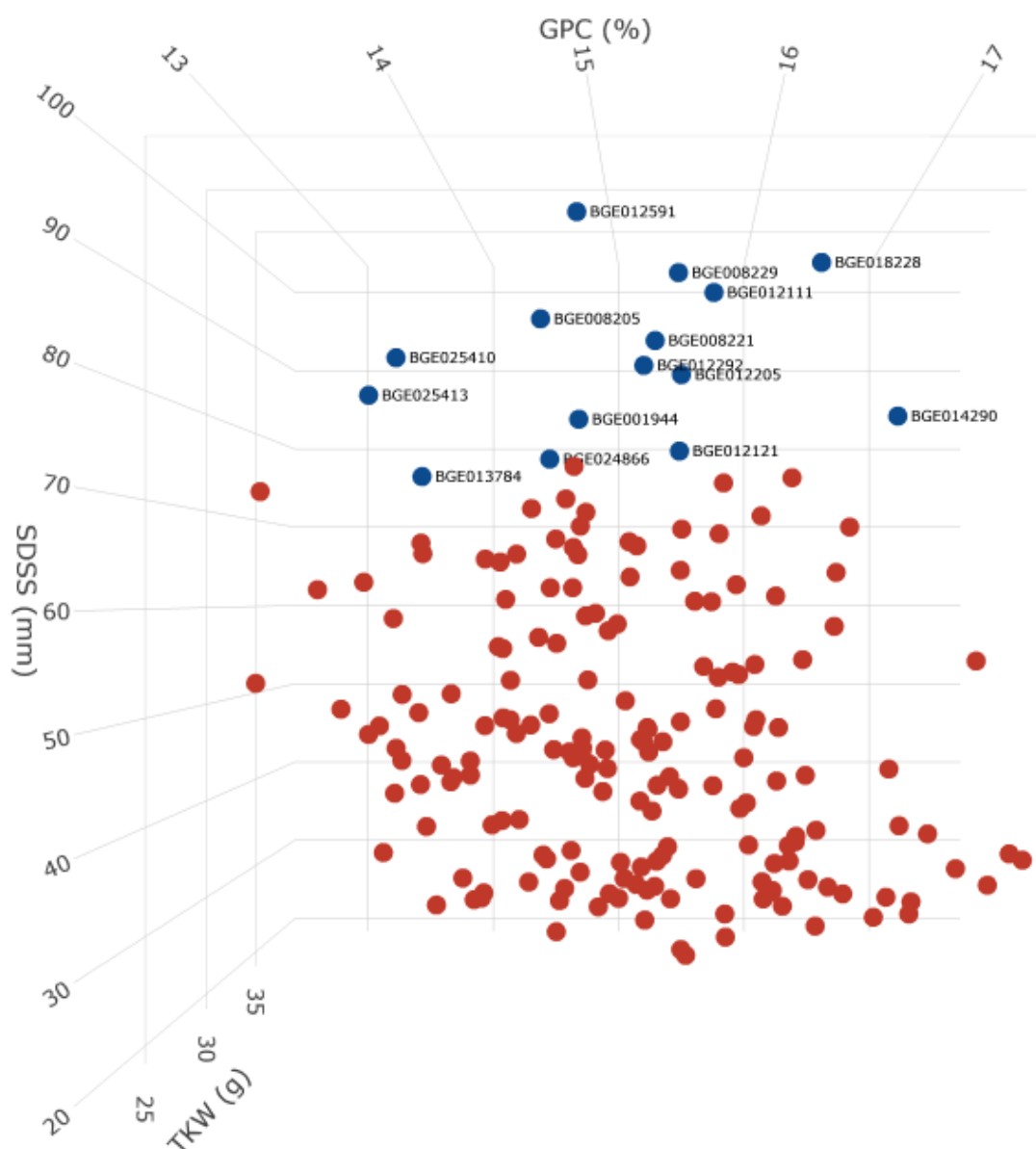
**Table S6.** Wilcox test for alleles' combination *Glu-A1:Glu-B1:Glu-D1*

	<i>a:d:a</i>	<i>a:e:a</i>	<i>b:7*+9:d</i>	<i>b:a:a</i>	<i>b:e:a</i>	<i>b:e:c</i>	<i>b:f:a</i>	<i>b:u:a</i>	<i>b:u:d</i>	<i>c:d:a</i>	<i>c:u:a</i>	<i>y:e:a</i>	<i>y:f:a</i>
<i>a:d:a</i>	-												
<i>a:e:a</i>	ns	-											
<i>b:7*+9:d</i>	**	***	-										
<i>b:a:a</i>	ns	ns	*	-									
<i>b:e:a</i>	ns	ns	***	ns	-								
<i>b:e:c</i>	***	ns	***	***	***	-							
<i>b:f:a</i>	ns	*	ns	ns	*	***	-						
<i>b:u:a</i>	*	***	ns	ns	***	***	ns	-					
<i>b:u:d</i>	ns	ns	ns	ns	ns	ns	ns	ns	-				
<i>c:d:a</i>	ns	ns	*	ns	ns	ns	ns	*	ns	-			
<i>c:u:a</i>	ns	ns	***	ns	ns	***	ns	*	ns	ns	-		
<i>y:e:a</i>	ns	ns	**	ns	ns	ns	ns	*	ns	ns	ns	-	
<i>y:f:a</i>	ns	***	**	ns	***	***	ns	ns	ns	ns	ns	ns	-

\* 0.05 > p > 0.05; \*\* 0.05 > p > 0.005; \*\*\* p < 0.005; ns: non significant.

**Table S7.** Mean and standard deviation for SDS Sedimentation test (SDSS, mm), Grain Protein Content (GPC, %) and Thousand Kernel Weight (TKW, g) for a selected set of landraces, and their HMW-Gs composition

Accession id	SDSS (mm)	<i>Glu-A1</i>	<i>Glu-B1</i>	<i>Glu-D1</i>	GPC (%)	TKW (g)
BGE012591	100,83 ± 9,09	<i>b</i>	<i>e</i>	<i>a</i>	14,81 ± 2,35	29,72 ± 1,10
BGE008229	95,00 ± 30,25	<i>b</i>	7*+9	<i>d</i>	15,47 ± 3,44	30,30 ± 8,34
BGE018228	95,00 ± 17,94	<i>a</i>	<i>f</i>	<i>a</i>	16,37 ± 2,47	28,98 ± 11,04
BGE008221	91,13 ± 18,89	<i>b</i>	7*+9	<i>d</i>	15,30 ± 3,04	35,46 ± 7,36
BGE012111	90,88 ± 12,75	<i>c</i>	<i>u</i>	<i>a</i>	15,68 ± 2,60	27,51 ± 4,72
BGE008205	88,00 ± 24,42	<i>a</i>	<i>u</i>	<i>a</i>	14,64 ± 3,18	27,05 ± 4,29
BGE012205	84,88 ± 9,20	<i>c</i>	<i>e</i>	<i>c</i>	15,49 ± 2,72	31,28 ± 4,72
BGE012292	84,50 ± 29,44	<i>b</i>	7*+9	<i>d</i>	15,25 ± 2,79	28,83 ± 3,66
BGE025410	84,25 ± 21,01	<i>b</i>	<i>i</i>	<i>d</i>	13,76 ± 3,14	27,07 ± 7,12
BGE025413	81,88 ± 20,18	<i>b</i>	<i>u</i>	<i>a</i>	13,48 ± 2,48	29,63 ± 5,64
BGE001944	80,13 ± 15,79	<i>a</i>	<i>f</i>	<i>c</i>	14,81 ± 3,19	31,29 ± 9,78
BGE012121	77,13 ± 23,26	<i>b</i>	<i>u</i>	<i>a</i>	15,48 ± 3,14	32,42 ± 5,73
BGE014290	76,00 ± 32,36	<i>c</i>	<i>al</i>	<i>a</i>	16,59 ± 9,21	21,10 ± 5,17
BGE024866	75,75 ± 13,60	<i>a</i>	<i>f</i>	<i>c</i>	14,62 ± 2,35	30,94 ± 8,97
BGE013795	75,13 ± 18,09	<i>b</i>	<i>e</i>	<i>a</i>	13,61 ± 2,85	35,13 ± 9,64



**Figure S3.** Set of fifteen landraces selected (in blue) based on SDS Sedimentation test values (SDSS, mm), Thousand Kernel Weight (TKW, g) and Grain Protein Content (GPC, %) to be further and deeply characterized in field trials.